JOURNAL
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

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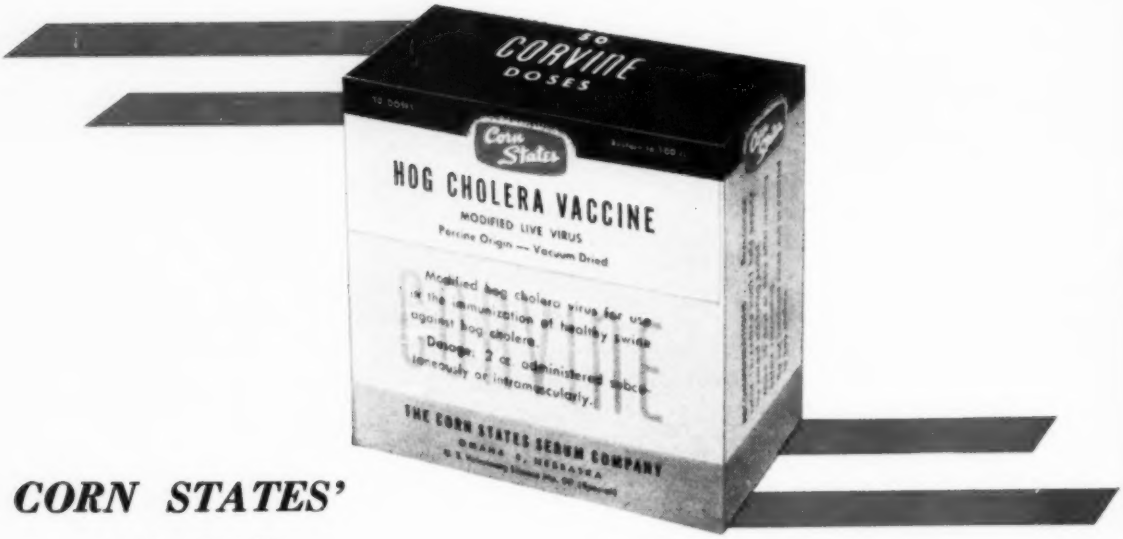

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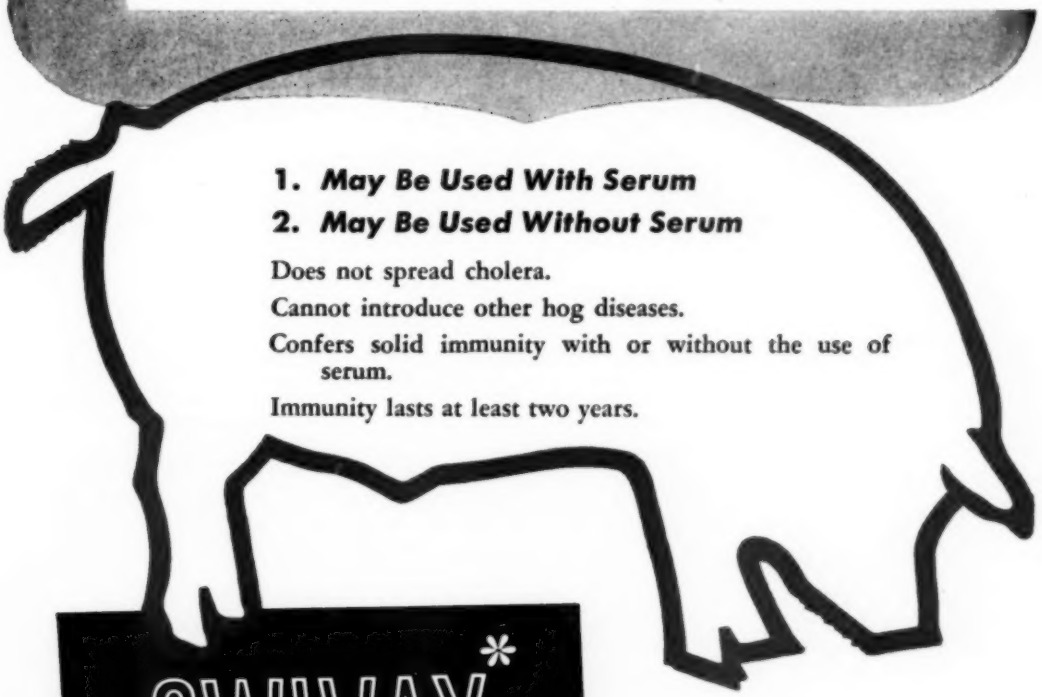

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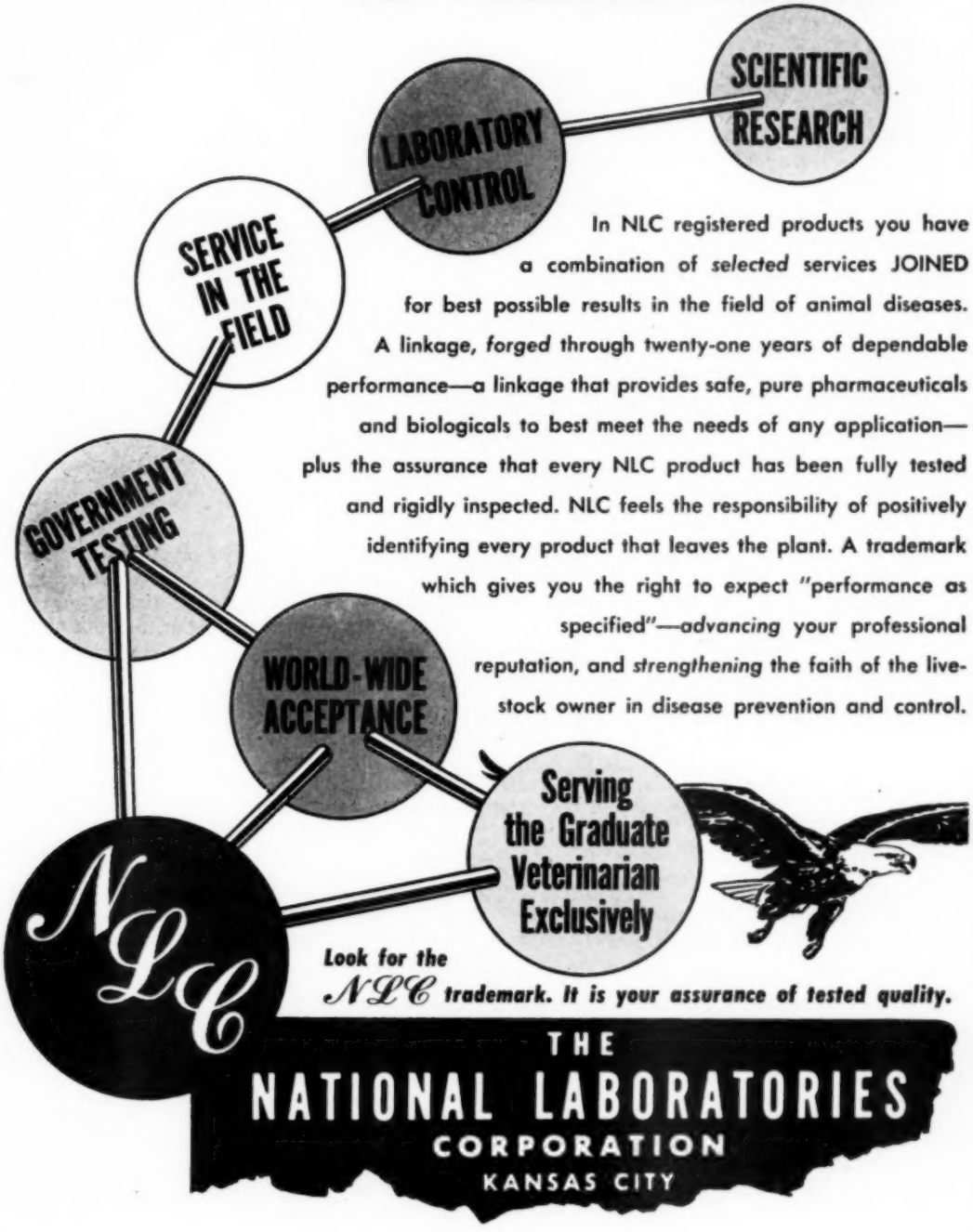

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AVMA ☆ Report

Veterinary Medical Activities

✤ The AVMA Special Committee on Animal Reproduction and Artificial Insemination met at the central office, Nov. 28, 1953. Drs. J. A. Henderson, chairman, D. E. Bartlett, W. H. Dreher, and E. A. Woelffer attended the meeting.

★ ★ ★

✤ The AVMA Special Committee on Medical Care of Laboratory Animals met at the central office, December 2. Drs. Thorpe, Brewer, Cass, Dieterich, Fisher, and Henthorne attended the meeting.

★ ★ ★

✤ Russell G. Rongren, director of membership services, attended the first general meeting of the professional scientific organizations which are coöperating in the establishing of the national register of scientific and technical personnel sponsored by the National Science Foundation in Washington, D. C., Nov. 30, 1953.

★ ★ ★

✤ Dr. Ottar Dybing of the Veterinary College at Oslo, Norway, visited the AVMA office in Chicago on November 9 and 10. He has been making a study of new pharmaceutical agents in this country, especially insecticides and their toxicology. He had spent considerable time at the research station at Kerrville, Texas.

★ ★ ★

✤ Dr. I. A. Alstrom of Stockholm, Sweden, called at the AVMA office on November 18. He has been visiting a number of the veterinary schools and research units in the northern states, making a study of mastitis. Dr. Alstrom also visited several of these stations three years ago.

★ ★ ★

✤ The Ohio Agricultural Experiment Station at Wooster held open house and dedication ceremonies at the new Veterinary Science Research Center, Nov. 4, 1953 (*see* pages 84-85). Executive Board Member W. R. Krill and Dr. B. T. Simms were guest speakers. Assistant Executive Secretary Kingman attended from the AVMA central office.

★ ★ ★

✤ Late November and early December witnessed the usual number of committee and board sessions at Association headquarters. Among the groups in session were:

Research Council — November 29
Board of Governors — December 1
Executive Board — December 2 and 3

★ ★ ★

✤ President J. A. McCallam attended the annual meeting of the Delaware V. M. A. in Wilmington on December 10 and a meeting of the Board of Directors of the National Health Council in New York on December 11.

★ ★ ★

✤ Dues notices for 1954 were put in the mail on Nov. 20, 1953. Members can assist in reducing the central office expenses by prompt attention to the first notice, thereby reducing the number of second notice mailings.

★ ★ ★

✤ Chairman W. A. Young of the Humane Act Award Committee has invited nominations for the 1954 Award. AVMA members and students of veterinary medicine are urged to send names of candidates and records of humane acts to the AVMA office immediately. Girls and boys under 18 years of age are eligible.

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1 Kakavas, J. C.; Roberts, H. D. B.; deCourcy, S. J., and Ewing, D. L.: *Chemotherapy of Bovine Mastitis with Furacin and Penicillin Mixture*, J. Am. Vet. M. A. 119:203 (Sept.) 1951.

2 Mires, M. H.: *Nitrofurazone with Penicillin in Bovine Mastitis*, Vet. News 14:9 (May-June) 1951.

3 Roberts, H. D. B.; Kakavas, J. C., and Biddle, E. S.: *Studies on Furacin-penicillin Gel in Treating Bovine Mastitis*, North Am. Vet. 34:247 (April) 1953.

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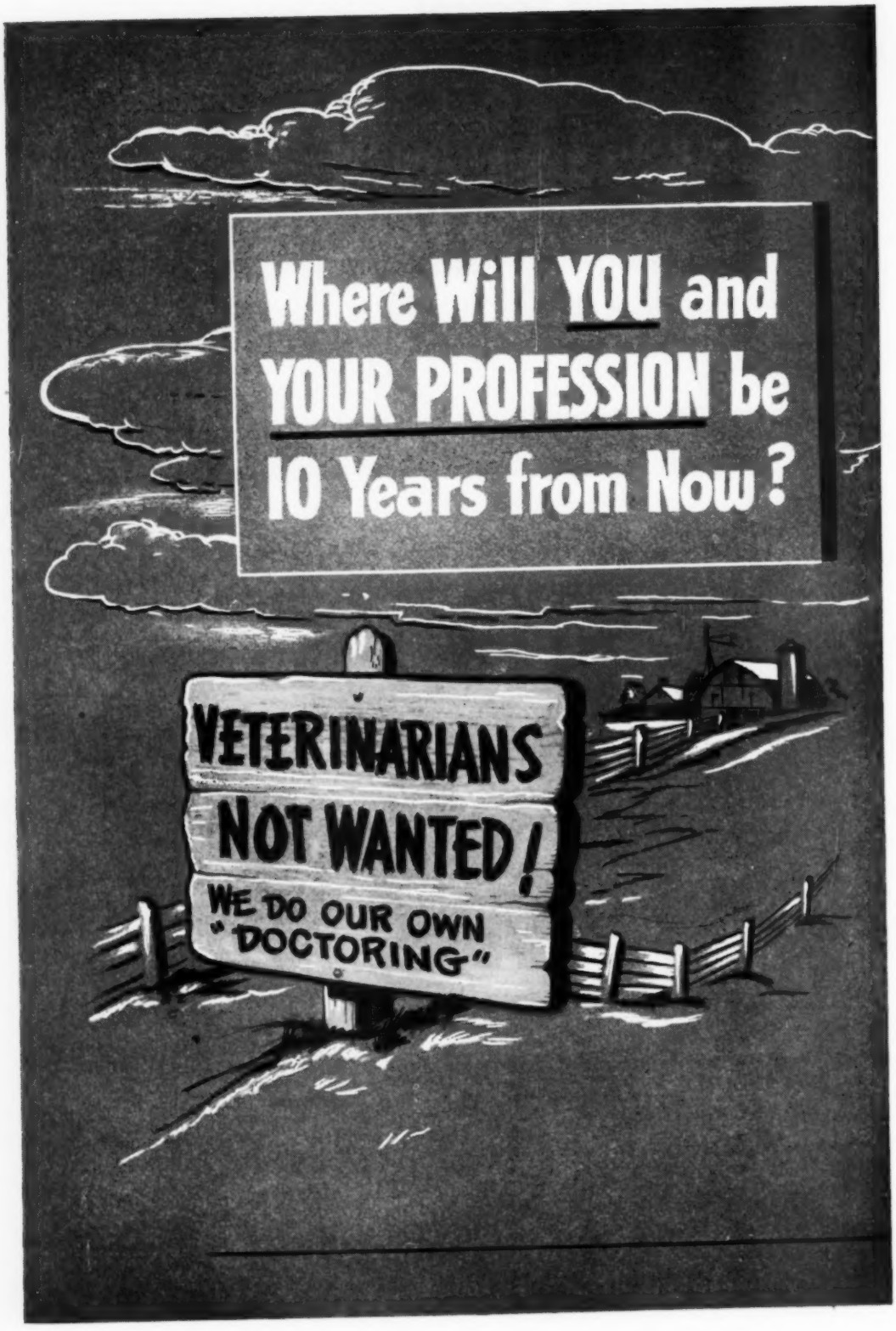
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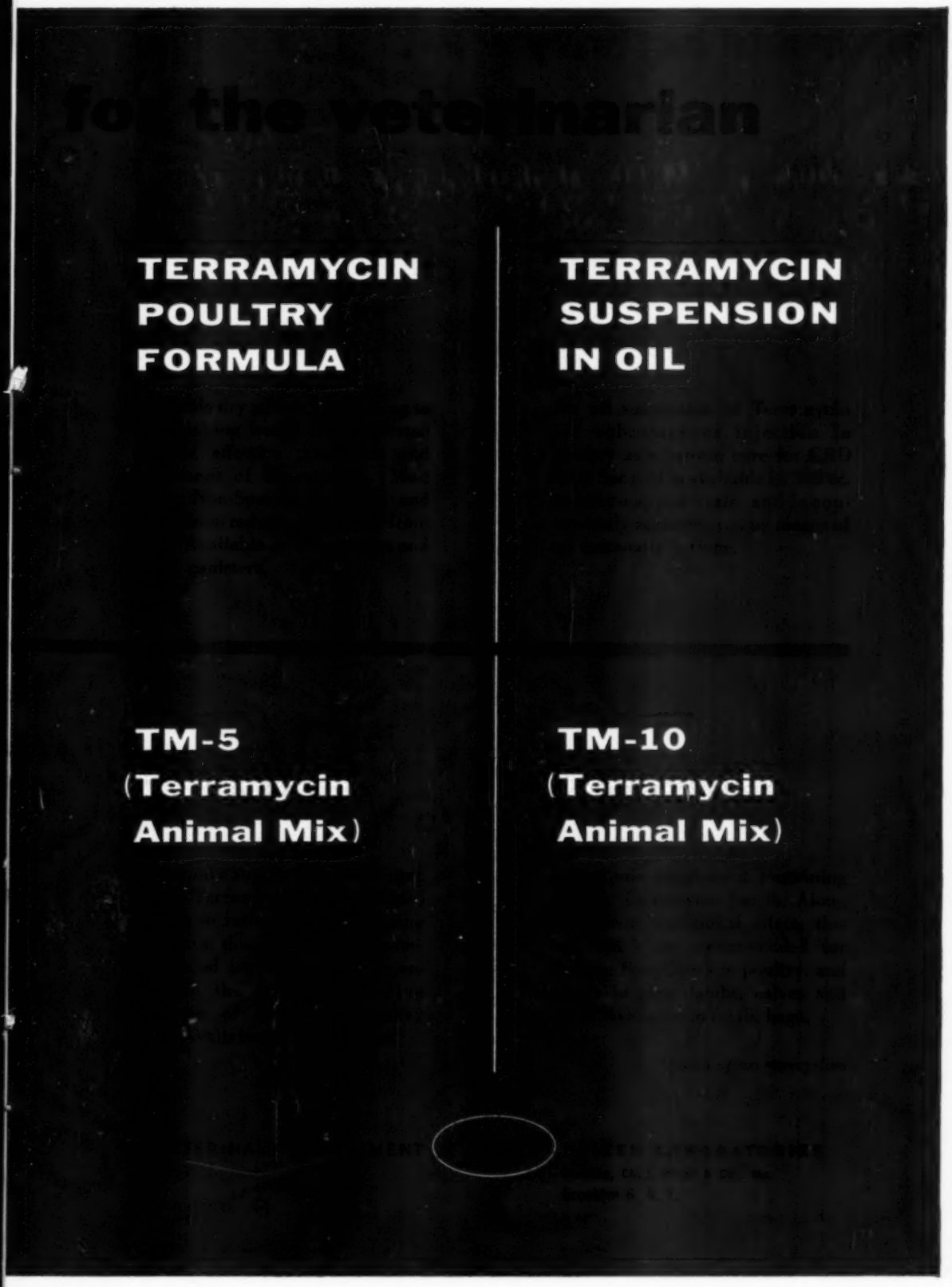
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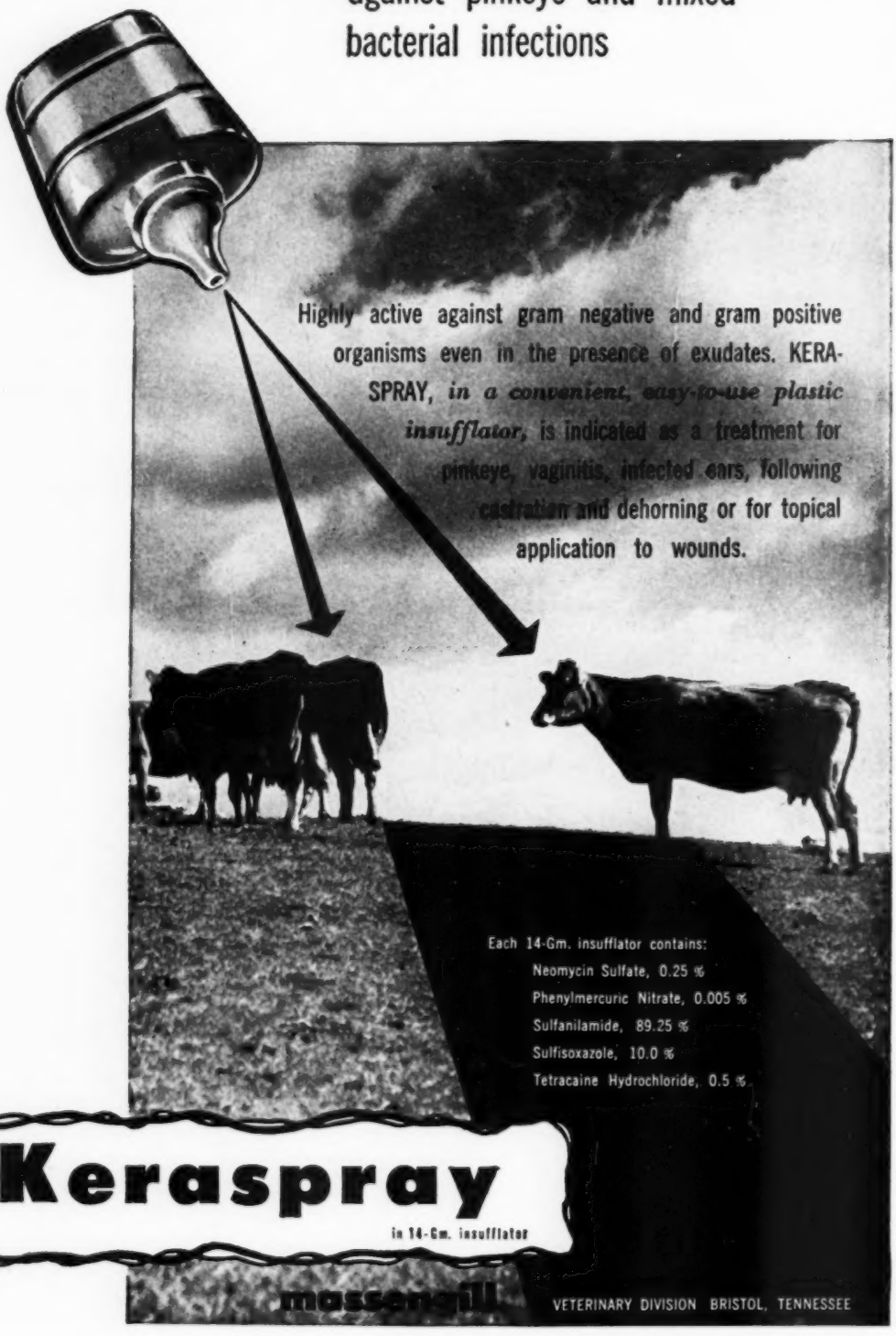
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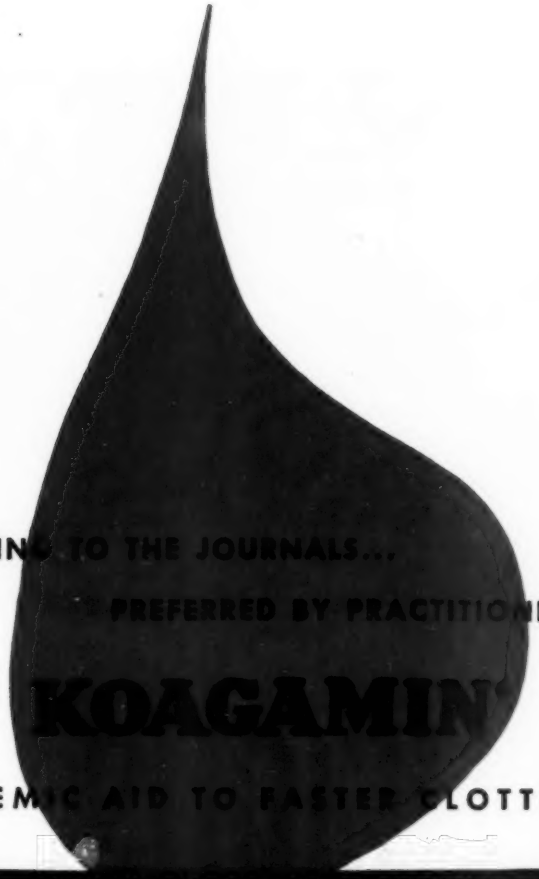

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(1) Whitney, G. D.: J. Am. Vet. M. A. *122*:21, 1953.
(2) Blamey, E. R.: J. Am. Vet. M. A. *119*:291, 1951.
(3) Klausman, B. S., Brown, H. W.: Vet. Med. *47*:235, '52.
(4) Scott, M. L.: Vet. Med. *48*:95, 1953.
(5) Klausman, B. S.: Vet. Med. *46*:282, 1951.

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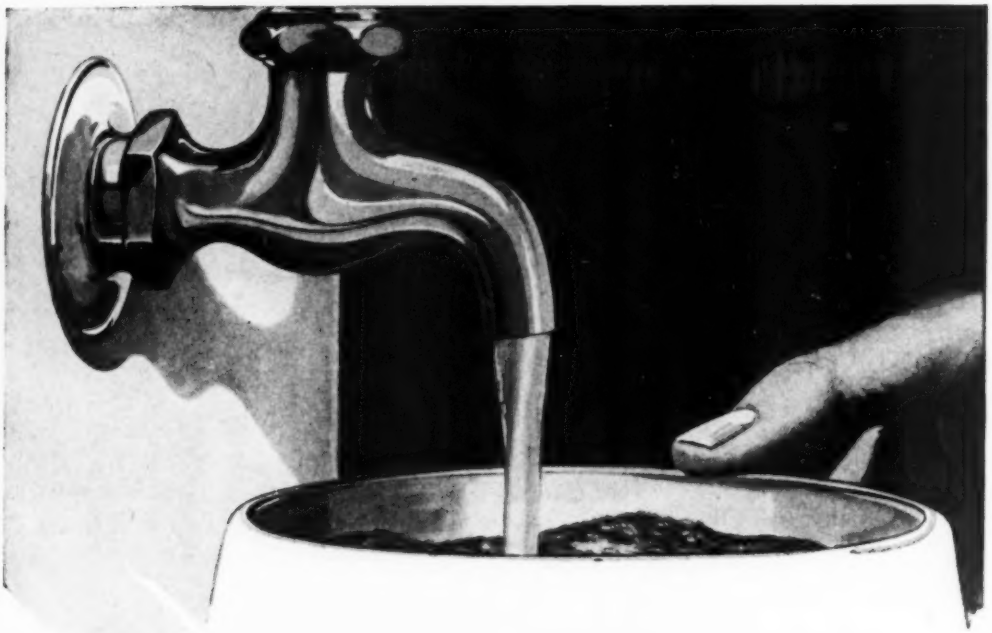

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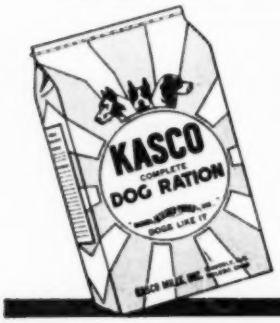

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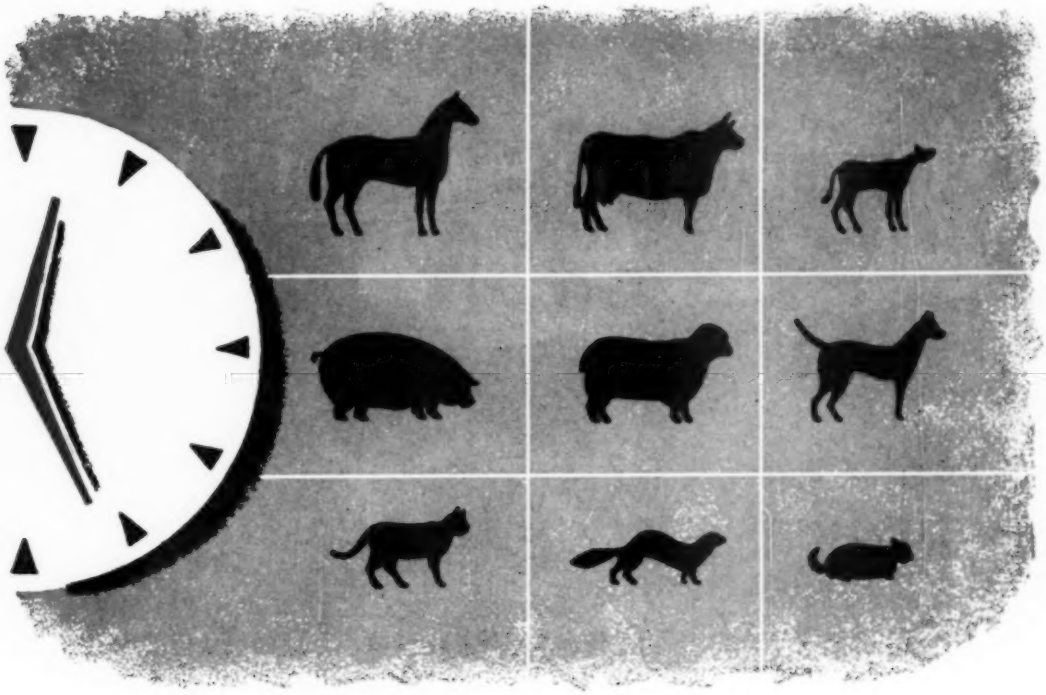

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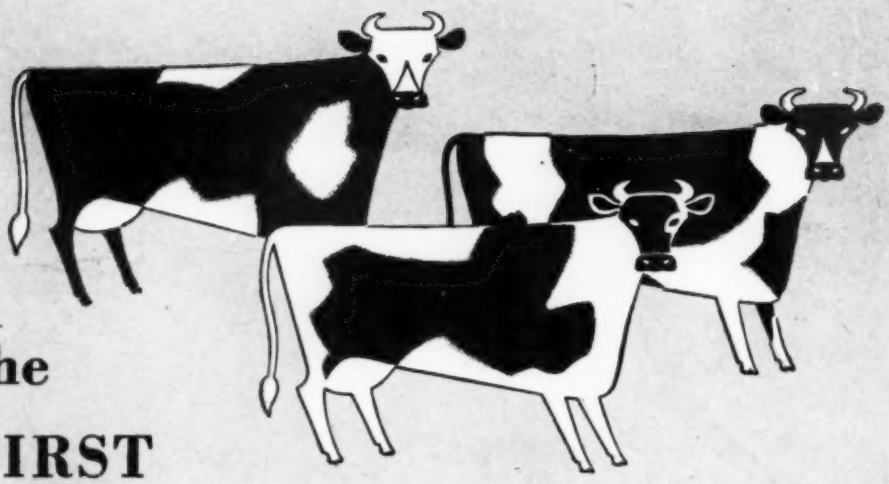

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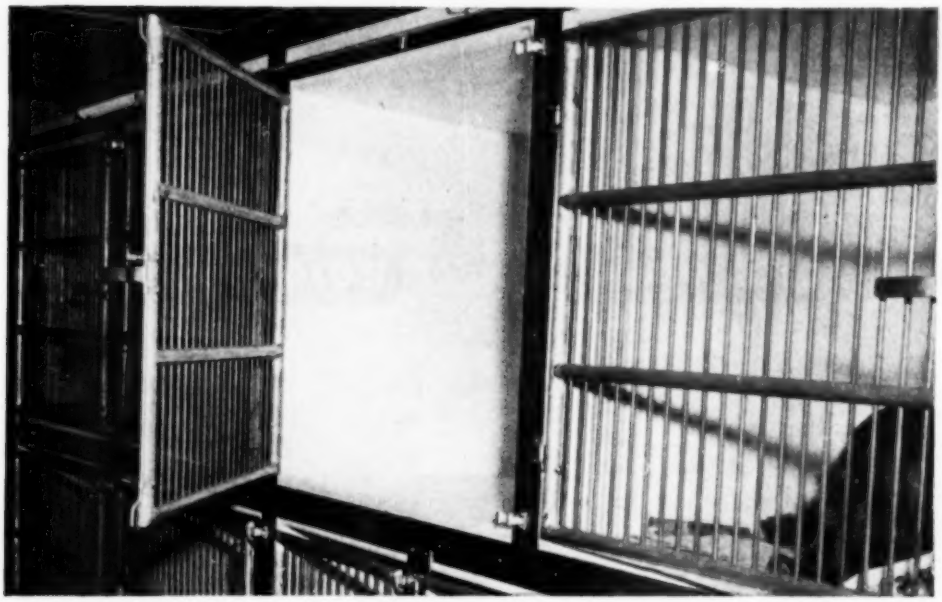

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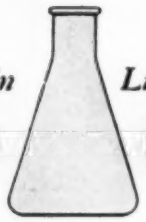

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1: Shaw, J. C., Hatziolos, B. C., Leffel, E. C., Chung, A. C., Gilbert, Janet: Studies on Ketosis in Dairy Cattle XVI: The Pituitary-Adrenal Cortical Syndrome 251-256. The North American Veterinarian, April 1953.

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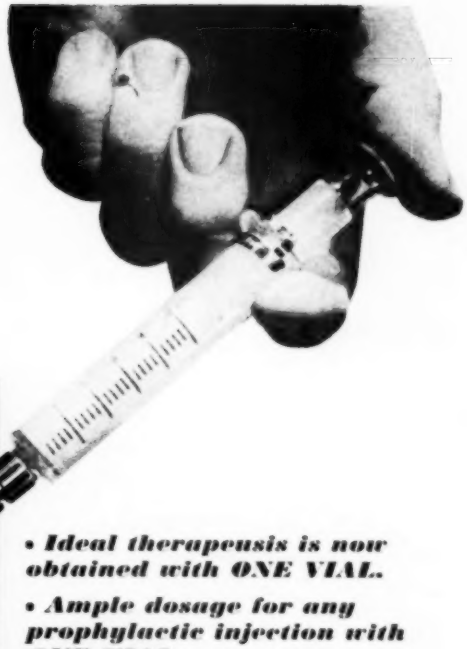

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[1] Pratt, R.; Dufrenoy, J., and Strait, L. A., J. Bact., 55:75, 1948.

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Descriptive literature on request.
Fort Dodge Laboratories, Inc.,
Fort Dodge, Iowa.

Journal
of the
American Veterinary Medical Association

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VOL. 124 JANUARY, 1954 No. 922

Foot Rot and Other Diseases of the Feet of Sheep

H. MARSH, D.V.M.

Bozeman, Montana

THERE APPARENTLY is some lack of understanding among veterinarians as to the true nature of the disease of sheep to which we apply the name foot rot, and as to its differential diagnosis and the methods of treatment and control. We have nothing new or original to present but perhaps a consideration of some of the practical problems presented in the field of ovine foot diseases may be appropriate.

The term foot rot has been used somewhat loosely to cover several conditions involving the feet of horses, cattle, and sheep. In the case of sheep, all authors using the English language have agreed to reserve the designation foot rot for a specific transmissible infectious disease of the claws, for which the German names are *infektiöse Klauenentzündung* and *Moderhinke*, and the French term is *piétin*. This disease is a different condition from the one in cattle which is referred to in this country as foot rot. It has not been given a scientific name, but is a definite disease entity.

SYMPTOMS AND LESIONS OF FOOT ROT

One of the symptoms of foot rot is severe lameness, usually in more than one foot. Frequently the affected sheep are seen feeding on their knees when both forefeet are involved. In typical cases, there is no involvement of tissues above the hoof, and no swelling. In advanced cases, the horn may be much deformed and overgrown.

The initial lesion is a tenderness and reddening of the medial face of the claw, or a surface necrosis of the soft horn of the inner face of the heel. In a few days, the process progresses to considerable areas of moist necrosis on the bulb of the heel and the medial face of the digit. After the necrotic process has extended through the soft horn of the bulb of the heel, it extends in the corium of the sole forward and laterally, until the whole sole is undermined and the laminar corium of the outer wall is attacked. The horny wall also separates from the corium to a greater or less extent, but continues to lengthen, so that in chronic cases the deformed horn often is curled over the sole and overgrown at the toe, resulting in a greatly deformed hoof. The coronary band and the tissues above the hoof do not become involved. The necrotic process in the laminar corium of the wall and the corium of the sole results in a gray caseous zone beneath the horn. A disagreeable odor is characteristic of the lesion.

Several authors have stated that the disease process may extend to the deeper tissues of the foot, involving the joints and ligaments, but we have not observed that condition. Beveridge[1] states that infection of the deeper tissues occurs on rare occasions, and that it may be regarded as secondary and probably not produced by the specific causative agent of foot rot.

In our experimental cases, produced by placing clean sheep on a wet pasture in which infected sheep had been held, the initial lesion appeared in ten to fourteen days. About fourteen days later, undermining of the sole usually was extensive; in some cases, the entire sole was involved.

From the Montana Veterinary Research Laboratory (Montana Experiment Station and Livestock Sanitary Board cooperating).

Paper No. 312 journal series, Agricultural Experiment Station, Montana State College, Bozeman.

Presented before the Intermountain Veterinary Medical Association, Salt Lake City, Utah, Jan. 20, 1953.

The process then extended from the sole to the laminae of the walls, so that within about thirty days of the appearance of the initial lesion, the laminae of the wall might be extensively involved. The final result in some cases was caseous necrosis of the corium of the entire sole and wall.

At the time when the initial lesions were noticed, the sheep were beginning to show lameness and, in some cases, within a week they were feeding on their knees.

DIFFERENTIAL DIAGNOSIS

Foot rot of sheep must be distinguished from the foot lesions of: (1) foot-and-mouth disease, (2) contagious ecthyma, and (3) ulcerative dermatosis or lip-and-leg ulceration. It must be differentiated also from suppurative conditions of the foot referred to variously as foot abscess and noncontagious foot rot. These other conditions may occur in many sheep in a flock and have been confused with foot rot. None is primarily a disease of the claw or hoof, as is foot rot. We have seen one other condition which was confined to the hoof and in which differential diagnosis was difficult—a flock of sheep in which trailing over rocky country had resulted in breaks in the sole and some necrosis of the tissue beneath the sole in many, and which resembled the lesion of foot rot.

In contagious ecthyma, or sore mouth, the most common lesion is the proliferative scabby lesion on the lips, usually involving the region where the skin of the lip joins the buccal mucosa, but we occasionally see foot lesions produced by this virus. The foot lesion appears on the interdigital skin and is characterized by tissue proliferation and a surface scab. The hoof itself is not involved.

In lip-and-leg ulceration, which we call ulcerative dermatosis of sheep, the foot lesion is characteristically on the skin of the anterior surface of the foot above the coronary band and may involve the interdigital region. This lesion is covered with a heavy scab, the removal of which leaves a raw, bleeding ulcer, with tissue destruction rather than proliferation. This condition also does not involve the hoof.

Probably the condition which has caused the most confusion is that produced by suppurative infections starting in puncture wounds of the interdigital region and referred to in English and Australian publications as noncontagious foot rot or foot abscess. This may develop in a considerable number of sheep in a flock which has been on muddy stubble fields or in muddy corrals, particularly when freezing and thawing are occurring. In the early stages of this condition, the differential diagnosis may be difficult for one who is not familiar with foot rot. As this condition develops, however, the process extends upward into the tissues and articulations producing a condition we call "bumble-foot." In our experience, no such an involvement of the foot occurs in uncomplicated foot rot.

ETIOLOGY OF FOOT ROT

In 1904, Mohler and Washburn[2] concluded that *Spherophorus necrophorus* was the specific cause of foot rot and, in the United States, their findings have been generally accepted while in other parts of the world some doubts remained. In 1928, Ludovic and Blaizot[3] described a new species of spirochete, *Treponema podovis*, as the etiological agent of foot rot, and Howarth,[4] in 1930, suggested that a spirochete might be the primary infectious agent. In 1934, Marsh and Tunnicliff[5] concluded that *S. necrophorus* was the primary infectious agent but were unable to reproduce the disease by experimental exposure of sheep to this organism by various methods, and concluded that there must be another undiscovered factor in the etiology of the disease.

In 1941, Beveridge[1] in Australia showed that the primary agent was *Fusiformis nodosus*, an anaërobe which is a near relative of *S. necrophorus*, and that *Spirochaeta penortha* acted as an accessory agent to produce typical foot rot. Beveridge's publication included work in the United States, where he found *F. nodosus* as the primary infectious agent in cases of foot rot occurring in this country.

In our work in which we found *S. necrophorus* constantly present, even in the very early stages of the infection, we may have overlooked the presence of *F. nodosus*, which is quite similar. Beveridge suggested that certain forms which in direct smears we had considered atypical *S. necrophorus* were probably *F. nodosus*.

As was reported in our bulletin[5] published in 1934, we failed to reproduce typical foot rot by using cultures of *S. necrophorus* which were recovered from foot rot lesions. Several methods of exposure were used. Four sheep were held one to two months in wet pens to which large amounts of *S. necrophorus* cultures were added at frequent intervals. The results were completely negative, although similar wet pens in which affected sheep were held were consistently infective for test sheep. Also, cultures of *S. necrophorus* were swabbed over scarified areas in the interdigital space of 4 sheep and the area was

sealed with sterile mud held in place by a bandage, with negative results.

Four other sheep were used for four different methods of introducing cultures into the foot. In 1, the sole of the foot was loosened and the culture introduced beneath the horn, with negative result. In another, the culture was injected into the laminar corium of the wall where it produced a suppurative lesion, discharging above the coronary band, but did not produce foot rot. In a third, the culture was injected into the corium of the bulb of the heel and the wall, with negative result. The fourth sheep is of interest in relation to the findings of Flint and Jensen[6] in their work with foot rot of cattle and sheep. A culture of *S. necrophorus* was injected above the coronary band and downward inside the wall of the toe to within a few millimeters of the plantar surface. Necrobacillosis developed along the line of inoculation, producing arthritis in the articulation between the second and third phalanx, but here again the condition which we recognize as foot rot failed to develop.

Beveridge found that while he could produce characteristic lesions of foot rot by the inoculation of *F. nodosus*, the lesions were relatively mild. Severe lesions typical of naturally occurring foot rot resulted only when the inoculum included both *F. nodosus* and *S. penortha*. In our work with foot rot, we failed to find spirochetes in the naturally occurring lesions.

PREDISPOSING FACTORS

A wet condition of the range, pastures, or corrals in which the sheep are handled is the principal predisposing factor in the development of foot rot. The infection does not spread through a flock of sheep on dry range, even though some carriers are present. If sheep are held on wet pasture until their hoofs become softened, and if there is a carrier in the band, the infection may spread quite rapidly through the flock. It is definitely known, however, that even extremely wet conditions will not in themselves cause the appearance of foot rot, and that the only source of the infectious agent is the infected sheep.

SIGNIFICANCE OF INFECTED PREMISES

It has been demonstrated at the Montana Veterinary Research Laboratory and by Beveridge[1] that the infectious agent lives on the ground or bedding only a short time after infected sheep are removed from the premises. In our experimental work, we maintained wet pens made infective by the presence of active foot rot cases. All sheep placed in these pens before the infected sheep were removed developed foot rot. After removing all sheep, one pen was allowed to dry. Test sheep placed in it after fifteen days remained healthy. The other pen was kept continuously wet, and test sheep placed in it at the end of a thirty-day period also remained healthy. Beveridge's findings indicate that probably the pens became noninfective within four or five days.

A confusing report in our bulletin on foot rot should be explained. In it we reported the above experiments which seemed to demonstrate conclusively that the infecting agent quickly disappeared from infected premises, but we qualified the conclusions because of a field observation which we had interpreted as meaning that the infection persisted in a swampy pasture from one season to the next, at least in an attenuated form. In that instance, the pasture became heavily infected as the result of a serious outbreak of foot rot in a flock of sheep summered on the pasture. The next summer, we grazed a flock of 41 sheep on the pasture and 12 of the 41 developed slight necrotic lesions in the soles of their greatly softened feet. *Spherophorus necrophorus* was recovered from the lesions but no typical foot rot developed.

We believe now that this finding should not have been interpreted as indicating that the infectious agent of foot rot can remain viable from one season to the next in a swamp. It simply showed that the *necrophorus* organisms seeded in the pasture by the infected sheep remained viable. We had previously determined, in our experimental infected pen, that *S. necrophorus* could be demonstrated in the soil for an indefinite time after the pens were no longer infective for sheep.

TREATMENT AND CONTROL

In treating foot rot of sheep, we believe that the objective should be the complete eradication of the infection in as short a time as possible. This means that palliative treatments, which may cause improvement in individual sheep without complete recovery, are of little value. In this category would be treatment with sulfonamides which, in our limited experience, has not been effective. The only treatment which we recommend consists of complete surgical exposure of all diseased tissue, followed by immersion of the foot in some bactericidal solution which also has an astringent effect.

Several such solutions have been tried in controlled experiments, and 30 per cent (saturated) copper sulfate solution has been found to be the most effective and practical. The only objection to this solution is that it stains the wool of the legs and possibly of some areas of the body, from splashing in the bath. As the Australians are sensitive to any staining or soiling of wool, some of them have used 10 per cent formalin which is quite effective, but even in Australia, it is placed second to copper sulfate.

In an infected flock of sheep, it is necessary that all the sheep be set up and that every foot be examined. Where any suspicious condition is seen, the foot must be trimmed. Where the infection is found, all horn covering the necrotic tissue must be removed. This must be done ruthlessly, as it is essential that no halfway measures be permitted. It is surprising how quickly the horn is replaced and the foot restored to usefulness. After surgical exposure of all the diseased tissue, all of the sheep in the flock should be walked through troughs containing 30 per cent copper sulfate solution.

Following treatment, the sheep should be moved to dry range if possible. There is no spread of the infection on dry range, and thorough trimming of the feet followed by running on dry range would usually effect complete recovery even without the use of a bactericidal foot bath.

If every affected foot is thoroughly trimmed and treated with 30 per cent copper sulfate, the disease should be eradicated in one treatment. However, it is almost impossible to obtain a perfect job of trimming every foot in a flock of sheep, so it is essential to observe the flock closely for any remaining active cases and, at a convenient interval, to repeat examination and treatment.

The fact that the premises lose their infectivity rapidly makes it possible to return clean sheep to such premises after they have been kept free from sheep for thirty days.

In Montana, a sheep outfit in which foot rot is diagnosed is placed under quarantine, and treatment is instituted under supervision of the State Livestock Sanitary Board. The quarantine is maintained until the state veterinarian is satisfied that there is not a single infected foot remaining. This always requires several months and sometimes two or three years.

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Leptospirosis in Man

Leptospirosis is frequent in those who work in sewers and in damp, rat-infested areas. It frequently affected those who fought in trenches in World War I. Swineherd's disease due to *Leptospira pomona* has occurred in other countries but no proved case of *L. pomona* infection in man has yet been reported in the United States. —*W. A. Hagan, D.V.M., Ithaca, N. Y.*

Miniature Pigs for Research

Progress is reported (Hormel Institute, Austin, Minn.) in the development of a pig which will mature at about 60 to 70 lb. A laboratory animal physiologically resembling man is needed and swine, like man, are omniverous. Miniature pigs would also facilitate swine research. The project was launched in 1949 by crossing three wild stocks of small size, then inbreeding with special attention given to fertility, survivability, early sexual maturity, size, and conformation. The most advanced generation at 6 months of age, averaged one third to one fourth the weight of market swine of the same age.—*Proc. Anim. Care Panel, Dec. 2, 3, 1953, Chicago, Ill.*

At least 20 daughters should be tested before estimating a bull's transmitting ability.—*Raymond Albrechtson, Ph.D., Cornell University, Ithaca, N.Y.*

Death in a Silo.—A young man was found dead in a low spot in a silo filled just twenty-four hours. Death was believed due to absence of oxygen and to the high concentration of carbon dioxide. Silage production involves the oxidation of carbohydrates and fermentation by lactic acid-forming bacteria. The first of these processes rapidly consumes oxygen, and both processes produce carbon dioxide gas.—*J. Am. M. A., Oct. 31, 1953.*

Capriculture

[When we received the picture of Mrs. Ned R. Harmon's goats from the United Press, we requested her to write the following brief story about her New Hampshire herd.—ED.]

All but one of the goats (*see* fig. 1) are French Alpines, which vary in color and combinations of color. They resemble the Toggenburg and Saanen (Swiss breeds) in general conformation. The French Alpines produce a good quality of milk in large quantities, making capriculture both fascinating and profitable.

Their breeding season runs from September until mid-February. Breedings may be spaced so as to have milk in all seasons. Most does have twins but the goat on the far left usually has triplets. The period of gestation is five months.

These goats are of better than average quality, giving 5 quarts of milk per day when fresh and maintaining a high, long period of lactation. The sire is descended from a record-breaking doe which produced 5,094.4 lb. of milk and 195 lb. of butterfat during a 365-day test. The sire weighs over 200 lb. Because I consider him excellent, his daughters are being bred back to him this season. This will be done once only. The buck is naturally hornless, a rare but desired quality which he seems to transmit to about a third of his offspring. The others have to be dehorned.

In raising young stock, I feed the young "doelings" milk until the age of 6 months, in addition to good pasture, hay, and grain. After all, there is no substitute for milk. I believe it was Hippocrates, referred to as the father of medicine, who gave the following advice for what today is called tuberculosis: "Let them live in high altitudes, drink goat milk, and take sunbaths." Many think goat butter and cheese are delicious, and the meat of young milk-fed bucks, called "chevon," is considered a delicacy.—*Mrs. Ned R. Harmon, Newport, N. H.*

—United Press Photo

Fig. 1—Mrs. Harmon is shown here with her herd of French Alpine goats in Newport, N. H.

Penile and Preputial Problems in the Bull

F. J. MILNE, M.R.C.V.S., D.V.M.
Fort Collins, Colorado

IF CURRENT literature is any indication, it seems that conditions affecting the penis and prepuce of the bull are neglected subjects in veterinary therapy, only four references[1-4] having been found within recent years in the journals of the English-speaking countries. Considering the high monetary value of some bulls, this omission is somewhat surprising. It is proposed, therefore, to discuss some of the problems facing the veterinarian when he is called to attend a bull suffering from one or more of the conditions affecting the penis and prepuce.

Abnormalities such as are encountered during infection with one of the venereal disease such as coital exanthema or trichomoniasis will not be described in this paper. In such conditions, attention will usually be drawn to the bull only after an examination of the female members of the herd has been carried out.

BALANOPOSTHITIS

Balanoposthitis is a compound word meaning inflammation of both the glans penis and the prepuce. This condition is quite commonly encountered in the bull. The prepuce of the bull is long and narrow and the preputial orifice is small compared to that of the horse; only two fingers at the most are admitted in the prepuce of the bull. The prepuce is lined not by mucous membrane but by a modified extension of the skin which is plentifully supplied with sebaceous glands; also the bull, on micturition, does not protrude the penis but urinates into the preputial cavity, thereby increasing the tendency to inflammation of this region.

Balanoposthitis may be primary or secondary. Cases in which it is secondary occur after fracture of the penis, the result of urinary extravasation following rupture of the uretha, and in abscesses of the posterior part of the sheath. Congenital factors, as encountered in polled breeds, may predispose to this condition. As seen in the field, it is usually characterized by a diffuse swelling of the anterior portion of the prepuce, though severe cases may also involve a backward extension of the inflammatory process. Heat and pain are evident on palpation. If the penis can be drawn out by hand or by the administration of epidural anesthesia, the extent of the condition will be readily evident. In many cases, however, due to swelling of the prepuce, phimosis is present and the glans penis can not be drawn out. Urination is painful and does not take place in the normal forceful manner.

The causes of this condition vary, but the following primary factors may be cited: bacterial infection from the bedding gaining access to a preputial lining especially if the lining is already devitalized by accumulations of smegma, foreign matter such as grass awns or cockleburs; or exposure of the penis to freezing temperatures. The writer recently removed two cockleburs from the preputial cavity of a Hereford bull admitted to the hospital with a severe case of balanoposthitis; his recovery was rapid. Lacerations and abrasions of the epithelium which become infected also predispose to the condition.

Prognosis.—The prognosis will depend on the extent and intensity of the inflammatory process. The chronic case with adhesions binding the glans to the wall of the cavity offers a less favorable outlook. Generally speaking, in balanitis the prog-

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My grateful thanks are due to Dr. James Farquharson, professor and head of the Department of Surgery, Colorado A. & M. College, who instructed me in the operations for correction of curvature of the penis; and to Mr. Robert M. Teegarden, Department of Anatomy, Colorado A. & M. College, who kindly drew the sketch illustrating the same operation.

nosis should be good, but in posthitis more guarded or unfavorable.

Treatment.—Irrigation of the sheath with saline or a solution of potassium permanganate at body temperature is carried out to remove accumulated smegma and debris. Sulfapyridine in oil is then injected into the sheath, by means of a dose syringe, twice daily until the condition is corrected. If adhesions are present, they must be broken down and sulfonamides in an oil base or ointment applied in grease-gun fashion to control infection and prevent readherence of the parts.

Recently, in a few cases involving relatively intractable bulls, the systemic use of terramycin® was employed with success; 3 Gm., intramuscularly, daily for three days usually corrects the condition. The first injection is given after douching the sheath. Ulcers as a complicating factor are dealt with later in this paper.

PROLAPSE OF THE PREPUCE

This condition (fig. 1) is often present along with fracture of the penis but clears up when the fracture is treated. The condition is also seen where no fracture exists, especially in the Aberdeen Angus, Polled Hereford, and Brahman breeds. In many instances, the cause is unknown though it is reasonable to suggest that, in some cases, bruising or infection of the prepuce may be predisposing factors. Any abscess or pressure in the posterior part of the sheath may also cause the condition.

Prognosis.—The prognosis depends on whether the condition is primary or secondary, on the extent of any laceration present, and on the length of time the organ has been prolapsed; the long-standing case with necrosis and ulceration being unfavorable for future breeding. In addition, the chronic case leads to the building up of a hard ring of fibrous tissue leading to phimosis which, unfortunately, may end the breeding life of the animal.

Treatment.—Recent cases where necrosis is not evident have been corrected by reducing the prolapse and placing three or four interrupted sutures of No. 3 medium chromic catgut across the preputial orifice. The purpose of these sutures is to prevent recurrence of the prolapse by greatly diminishing the size of the orifice. Urination is not inhibited. The orifice is sutured as follows: Allis forceps are placed on the dorsal and ventral regions of the orifice and the round opening is converted into a slit by exerting slight traction on the forceps. The suture needle is passed through skin and preputial lining on one side, crossed to the other side, and passed through the lining before emerging through the skin. Sulfapyridine in oil is dispensed to the owner, for twice daily injections into the sheath by means of a dose syringe, in an attempt to counteract secondary infection, particularly with *Actinomyces necrophorus*. The sutures will, in most cases, disintegrate within three or four days, by which time the swelling and congestion of the formerly prolapsed prepuce will have subsided.

In the chronic case, the fibrous and necrotic nature of the mass usually renders reduction impossible. In this case, the mass is amputated, and interrupted sutures of No. 2 catgut are used for coaptation of the skin and preputial lining. The technique is similar to that used in one of the methods employed for amputation of a prolapsed rectum in that a ring of sutures is placed in order to effect union between the skin and preputial lining. To avoid postoperative stricture of the orifice and consequent phimosis, allowance must be made for scar contraction by the removal of a triangular portion of tissue as described under the treatment of phimosis.

Fig. 1—Prolapse of the prepuce and secondary myiasis in an Aberdeen Angus bull.

In many cases, amputation of the prolapsed membrane means the end of the breeding life of the bull because the protrusion of the penis is in direct proportion to the length of the reflected part of the prepuce which has been shortened. In other words, the greater the mass resected, the less favorable are the breeding prospects.

PHIMOSIS

Phimosis or inability to protrude the penis from the sheath in the bull may be congenital or acquired, the latter being more common. It is caused by anything which constricts the preputial orifice, such as severe cases of balanoposthitis, or which causes enlargement of the glans penis, such as neoplasia. It has also been known to occur following the amputation of a prolapsed prepuce where adequate measures were not taken to prevent cicatricial contraction, or where a prolapsed prepuce has suffered from bruising or necrosis.

Fig. 2—Paraphimosis in an Aberdeen Angus bull.

Treatment.—Correction of phimosis necessitates the removal of the primary cause in the case of balanoposthitis or neoplasia. Where narrowing of the orifice is the cause, surgery is indicated. This consists of the removal of a triangular portion of skin from the ventral aspect of the sheath. The base of the triangle is anterior and includes the margin of the original orifice. After removal of the skin triangle, an incision is made in the midline through the preputial membrane, and the latter is sutured to the skin on the corresponding side by means of interrupted sutures of No. 3 catgut.[5]

PARAPHIMOSIS

Paraphimosis (fig. 2) is the inability to withdraw the penis into the prepuce after protrusion. The cause is not definitely known in many cases but it may occur if some of the hairs of the preputial tuft are drawn into the preputial orifice on retraction of the penis. Exposure of the glans results in irritation, with subsequent swelling which renders impossible the spontaneous return of the penis to its normal location.

In the horse, debility is cited as the cause of paraphimosis leading to paralysis of the retractor penis muscles, but the writer has not yet seen any cases in the bull caused by generalized weakness or neuromuscular paralysis. In the bull, the condition is to all intents a strangulation of the protruded portion of the penis due to the naturally small preputial orifice. The degree of damage to the prolapsed organ depends on the duration of the condition; some long-standing cases will show necrosis and gangrene of the glans penis while those of longer duration will often show hyperplasia following the sloughing process, leading to the formation of a "club penis" which will not respond to the treatment outlined here.

Prognosis.—The prognosis is surprisingly good, provided stricture of the urethra has not occurred as a result of the damage done to the glans, and provided a "club penis" has not resulted.

Treatment.—It is the writer's opinion that surgical intervention is contraindicated and that better results follow when spontaneous separation of the gangrenous portion is allowed to occur. Nature's efforts should, however, be supplemented by therapeutic assistance in the form of support and oily medication of the prolapsed penis. Support is absolutely essential. A burlap sack is split down either side and a pad of cotton is placed in the center of the sack and fixed there with a few sutures. This cotton pad is soaked with 2 or 3 oz. of cod liver oil and placed against the organ. The ends of the sack are brought over the loins and secured in the form of a many-tailed bandage. This treatment is more efficacious than surrounding the glans with oiled cotton and a bandage. The supporting bandage is changed at least once, preferably twice, daily because it soon becomes soiled with urine. In two to three weeks, depend-

ing on the severity of the original condition, the gangrenous area will have sloughed and the penis will be drawn back into the sheath. This treatment has also been used in the stallion, doing away with the necessity for amputation of the penis.

If urethral stricture has occurred, amputation of the affected part will be necessary. Contrary to general opinion, amputation of the terminal portion (2 to 3 in.) of the penis will not interfere with breeding capabilities. Should the penis still remain prolapsed. it can be assumed that the retractor penis muscles have lost tone because of over-stretching and complete withdrawal into the sheath may never occur despite nerve-stimulant treatment.

PAPILLOMATA AND FIBROMATA

Papillomata and fibromata (fig. 3) affecting the penis are easily recognized by their pedunculated appearance. They seem to be most common in young bulls (15 to 24 months old) and on the terminal 3 or 4 inches of the glans penis. They may be single or multiple.

Treatment.—The solitary neoplasm is easily removed with a scalpel and sutures but when many are present, surgery may be out of the question. The use of wart vaccine may or may not help the condition. One method of treatment has been to ligate the base of the pedicle of the tumor—a tedious task when many warts are present. The electrocautery may be necessary to control hemorrhage before applying sutures.

ULCERS OF THE PENIS

Occasionally, a bull has a history of developing a hemorrhage from the penis at the time of service. By teasing, the bull may be induced to extend the penis, revealing the presence on the glans of an ulcer penetrating into the corpus cavernosum penis.

Treatment.—The ulcer is excised, the wound edges are approximated with catgut sutures after hemostasis is complete, and the bull is given sexual rest for two or three weeks.

FRACTURE OF THE PENIS

In this condition, there is a break in the tunica albuginea which permits the escape of blood from the corpus cavernosum penis into the tissues surrounding the body of the penis. Since the break invariably occurs within, or just anterior to, the second curve of the sigmoid flexure, and is dorsal in position, the symptoms given by the owner are that there is an ovoid swelling over the penis (surrounding the penis) just in front of the scrotum with, in many cases, an accompanying prolapse of the prepuce. Urination is not inhibited.

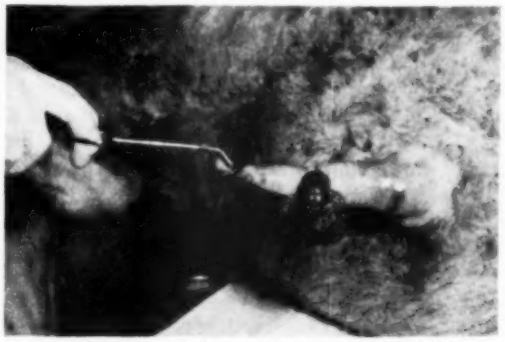

Fig. 3—Fibroma of the penis in a 1-year-old Hereford bull.

Prognosis.—If the case is treated within one week of injury the prognosis is good, provided the owner has facilities for teasing the bull after the operation. If, on the other hand, several weeks or even months have been allowed to lapse, the outlook will vary from guarded to unfavorable, since, during the organization of the hematoma, the penis becomes bound in the sheath by fibrous tissue formation and extrusion is impossible. The possibilities of cryptogenic infection can not be ignored.

Treatment.—If the breeding ability is to be salvaged, the only treatment is surgical intervention. The optimum time for surgery is between the third and fifth day after occurrence of the fracture. By this time, the hematoma will have formed but the degree of organization will be minimal. The bull is restrained in lateral recumbency, the type of anesthesia being a matter of individual preference. The writer prefers the use of anterior epidural anesthesia supplemented, if necessary, by chloral narcosis. Local anesthetic infiltration along the intended line of incision may also be necessary.

The incision is made in front of the scrotum, laterally, parallel to and over the penis, the site usually coinciding with the greatest part of the swelling. The incision is made through skin and subcutaneous

tissue. The only muscles likely to be encountered are the posterior preputial muscles (retractor muscles of the prepuce). These muscles vary greatly and may even be absent. The blood clot is completely removed and the edges of the torn tunica albuginea are approximated with No. 2 catgut. The cavity created by the blood clot is obliterated, as far as possible, by closure with No. 2 catgut. The cutaneous incision is then closed by an interrupted or interlock suture of monofilament nylon. If no hemorrhage is created by the removal of the clot, drainage is unnecessary. Commencing twenty-four hours after surgery, the bull should be teased daily but not permitted to serve a cow for two weeks, so that repair will remove the possibility of refracturing the penis. This is one of the few inflammatory conditions in which rest is contraindicated; in fact, much of the success of this operation depends upon the postsurgical activity of the organ. Where no history is available and the swelling is hard and apparently fibrous, differentiation from a chronic or cold abscess is necessary. This is most easily accomplished by aspiration with a hypodermic needle.

Should the condition be chronic, the operation requires the removal of fibrous tissue instead of blood clot. The penis must be freed from all fibrous adhesions. In many cases, the original fracture will have already healed—frequently with deviation at the site of the break. In this type of operation, there is bound to be some hemorrhage from the broken-down adhesions which will defy orthodox means of hemostasis. In this case, sulfanilamide ointment is smeared over the oozing surfaces and a sterile gauze pack is placed in the cavity after partly suturing the skin and subcutaneous tissues. The suturing is completed except for a small opening at the anterior extremity through which an inch or so of gauze is allowed to protrude. This gauze acts as a drain to prevent renewed hematoma formation. The owner is directed to remove the pack next day, prior to teasing the animal. The postoperative use of testosterone to stimulate libido has also been suggested.[6]

If a cold abscess is found, the fibrous wall of the abscess may involve the penis, again requiring the freeing of that organ.

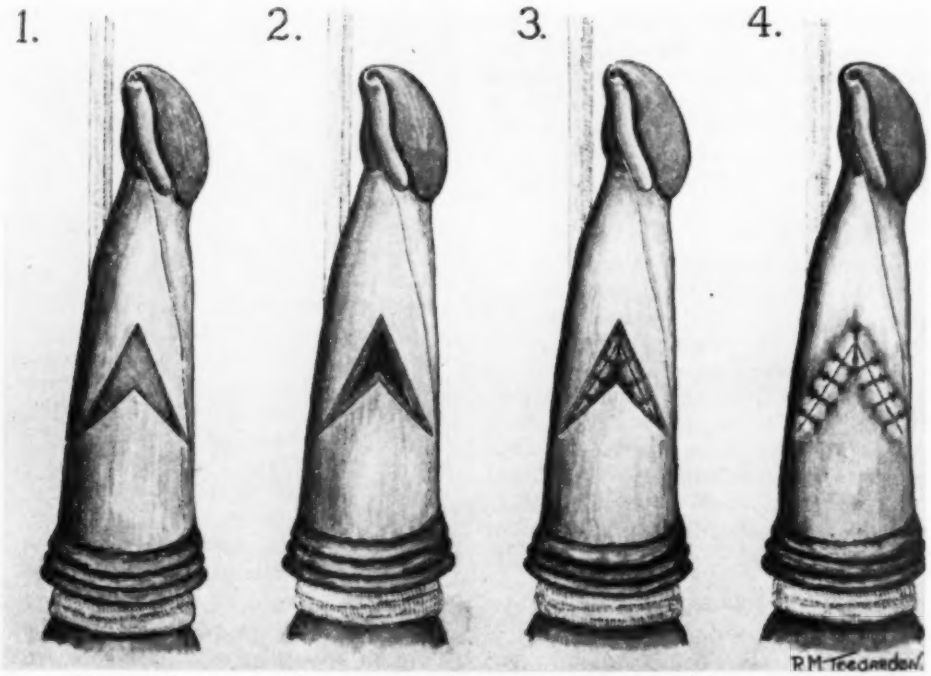

Fig. 4—Steps in the operation for correction of deviation of the penis: (1) removal of the penile integument; (2) removal of the tunica albuginea; (3) closure of the tunica albuginea; and (4) closure of the penile integument.

CURVATURE OR DEVIATION OF THE PENIS

This condition (fig. 4) commonly occurs in the preputial portion of the penis and precludes natural service. Since it seems to be most commonly encountered in polled breeds, an inherited tendency has been suspected. In these animals, there appears to be a natural weakness which leads to a downward or, less commonly, a lateral or spiral deviation. It has also been observed in young bulls, not necessarily of the polled breeds, without any history of trauma. In older animals that formerly had a normal penile conformation, the curvature may result from scar contraction following lacerations such as sometimes occur when the bull attempts to breed a cow through a wire fence. It may also follow balanoposthitis or ulceration with cicatrization.

In the case of a downward curvature, the more the animal is used for service, the worse the condition becomes.

Treatment.—Prior to surgical intervention, which is the only suitable form of treatment, it is absolutely necessary to try the bull on a teaser cow to accurately determine the exact site for operation and the amount of correction required.

After administration of anterior epidural anesthesia, the bull is restrained in lateral recumbency on the side opposite to the intended incision. A gauze noose is placed around the penis posterior to the site for incision and is handed to an assistant. Using a sharp knife, a "V"-shaped incision (fig. 4 [1]) is made through the integument on the convex side of the curvature (no curvature is evident during the quiescent state) with the apex of the V pointed toward the tip of the penis. A second V, with shorter limbs (fig. 4 [2]), is made within the confines of the first V and the isolated portion of integument removed. A similar but slighty smaller pair of V's is made through the tunica albuginea, (fig. 4 [2]), and the isolated portion of tunica is then removed. By means of a simple, single catgut suture, the apices of the two V's in the tunica are approximated (fig. 4 [3]). The corresponding arms of the V are then brought together by interrupted sutures (fig. 4 [4]). This procedure is repeated on the integumental incisions. In extreme cases, it may be necessary to make two sets of V incisions, one in advance of the other. The noose which has acted as a tourniquet throughout the operation is then removed and the penis returned to the prepuce. After resting a week, the bull should be tried at service to learn whether sufficient correction was made.

An alternative method is to remove an ellipse of tissue from the convex side of the curvature, the ellipse being directed obliquely along, and not actually transverse to, the axis of the penis. The opposing edges of the ellipse are approximated by interrupted catgut sutures. In the "spiral" form of curvature, the latter method is the one of choice. Daily postoperative irrigations of sulfapyridine in oil are indicated until healing is complete.

URETHRAL CALCULUS

While not primarily a disease of the penis, this condition is mentioned because on occasions a stud bull is presented with symptoms of urethral obstruction. It is obvious that if the bull's breeding capacity is to be conserved, the routine "permanent fistula" operation as practiced in steers is not acceptable. The only suitable method is to locate the obstruction by means of a catheter passed up the relaxed and protruding penis, and to incise the urethra and remove the obstruction. On account of the tendency to stricture formation, the incisions should be left open. The urine will eventually find its way along the normal channel to the urethral orifice. Should the obstruction be removed from the suprasigmoidal portion of the urethra, the formation of an area of necrosis or "urinary abscess" is likely, due to the escape of urine into the tissues. The area should be opened, drained, and treated as a wound with second-intention healing.

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Symptoms of Splenic Pain in the Dog

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THE CONDITION of splenic pain, apparently seldom recognized by clinicians, can present varying symptoms that warrant attention. In an attempt to explain how symptoms are related, directly or indirectly, to splenic pain, three case histories are presented.

CASE HISTORIES

Case 1.—A male Springer Spaniel, 6 years of age, was in a state of severe epileptiform convulsions. The owner requested euthanasia. Periodic seizures had occurred every few weeks for the past two years. The convulsions would continue for periods of ten to forty-five minutes, between which the animal appeared normal except for fatigue. Several veterinarians had been consulted with the most common diagnosis being epileptic convulsions. After sedation, enemas, and remaining in a kennel for a few days the dog usually would appear to be normal. The spasms were preceded by an uneasiness or a disinclination to move and were followed by temporary exhaustion.

Because of an interest in the cause of such convulsions, permission was obtained from the owner to study the case. A detailed examination, including abdominal radiographs, was made with the animal under sedation. The ventrodorsal view showed the spleen as an opacity. The blood picture revealed a 3 per cent reticulocyte count. As the animal was recovering from anesthesia, considerable pain was indicated upon palpation of the spleen. After recovery from anesthesia, the animal walked stiff-gaited with tucked-up abdomen and resisted abdominal palpation, especially in the splenic region. A gradual return to normal occurred during the following week and palpation of the moderately enlarged spleen was possible with only slight pain. Permission was obtained to perform a splenectomy, after which a decided improvement occurred by the third day. The dog was released on the seventh postoperative day in apparently normal condition. Observations during the next two years revealed an excellent recovery in attitude, disposition, and physical condition.

Case 2.—A female Fox Terrier, 7 years of age, arrived in a box lying in the sternal position with a flaccid paresis of the limbs. Euthanasia was requested but the alertness of the patient stimulated an attempt to determine the factors involved. The anamnesis revealed several forms of treatment over the past year but the dog continued in the same sternal position.

Examination revealed no visible defects except the inability to walk. When placed in a standing position, the dog could take a few feeble steps—enough to allow elimination. Reflexes were stronger on flexion than on extension. Several radiographs, urinalyses, and blood studies were made. The radiographs revealed only slight intervertebral ossification and splenic enlargement. Various therapeutic procedures were attempted for the next week, without results. A laparotomy revealed the spleen to be several times the normal size, firm, and reddish blue. Splenectomy was performed.

In about ten days, the dog could pull herself from the box, and within two weeks could assume a natural posture. The owner encouraged the dog to walk and continued massage treatments for the next three or four weeks. After several weeks, the dog had completely recovered.

Case 3.—A spayed female Dachshund is of particular interest because of the indirect symptoms from splenodynia. She is owned by the author and the anamnesis is accurate. Her diet since puppyhood consisted largely of lean, raw beef. Her condition was excellent until about one year ago when a sudden seizure of vomiting occurred. The tentative diagnosis was poisoning and treatment consisted of mild catharsis and colonic irrigations. An apparent recovery followed. Several days after this seizure, a gradual weakening of the hind legs and a slight kyphosis became evident. Clinical examination revealed a slight rise in the packed cell volume (53%) and reticulocyte count (3%), and radiographs showed an opacity in the splenic region. Palpation of the left hypochondrial and

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umbilical regions induced distinct evidence of pain.

Because of interest in the condition, a complete posterior paralysis was allowed to develop for one week. During the following week, 100 mg. of pyridoxine and thiamine hydrochlorides were given, intravenously, every second day. Small doses of milk of magnesia and light enemas were administered. After eight days without improvement, splenectomy was performed. The reddish blue spleen, several times normal in size, was lying across the ventral abdominal floor.

Postoperative treatment consisted of manual massage only. Complete recovery occurred gradually in the following two weeks. Observation has continued for a year with no indications of a recurrence.

DISCUSSION

It is known that a displaced or enlarged spleen may cause little or no pain and that splenic tumors of considerable size may cause no difficulty except inconvenience. Also, the enlarged spleen may often be palpated without evidence of pain. The position of the spleen in relation to its attachments is presumably a major factor in causing splenodynia. Kuntz[1] states, "The pain associated with enlargement of the spleen probably is due to traction of the splenic attachments." The dorsal, larger portion of the spleen is attached by the suspensory ligament, with the gastrosplenic omentum passing from the hilus to the greater curvature of the stomach.[2] When the spleen is in the normal position, splenic pain is reflected in the left parachondrium, but when it is displaced, the pain might be reflected in adjacent abdominal regions. Changes in the size of the organ are apparently normal, as graphically represented by Lichtwitz.[3] The normal and abnormal variations in the position of the spleen and the change in its blood volume[4] due to its blood reservoir function, make it subject to a variety of painful conditions.

If the position of the spleen is changed by its enlargement, by pressure from other viscera or by the animal's movements, traction on the splenic ligaments may induce pain. Since the pain varies with the degree of traction, a variety of symptoms are possible, from simple colic to overwhelming pain. A similar condition exists in man, as related by Christopher.[5] His discussion of splenic anomalies describes a variety of symptoms, due to pressure or traction, from stasis of the bowel to those of violent pain.

The symptoms of drastic convulsions cited in case 1 could be explained by severe splenic pain induced when this organ assumed certain positions. When, due to relaxation, rest, or other forms of therapy, the organ returned to a painless position, the symptoms would stop and recur only when the position again caused traction on the splenic ligaments. The removal of the spleen, therefore, would yield complete recovery.

The presence of constant splenic pain with secondary muscular atrophy of the limbs is represented by case 2. This animal evidently obtained relief from splenic pain only by remaining in the sternal position, which eventually caused muscular atrophy of the limbs. She would voluntarily use her limbs only when elimination was necessary. The removal of the source of pain by splenectomy and the encouragement to overcome the muscular atrophy resulted in complete recovery.

The indirect symptoms of posterior paralysis, as associated with splenodynia in case 3, might be explained in part by bowel stasis. The presence of pain was evident when the animal flinched upon palpation of the splenic region. The tucked-up abdomen and kyphosis were evidence of a moderate but continuous pain. This condition, causing a bowel stasis, probably resulted in autotoxemia. The latter, as suggested by Kirk,[6] is generally accepted as a contributing factor in posterior paralysis. However, other factors probably were involved because general stimulants and enteric lavages were of no benefit. The decreased vertebral circulation, due to immobility of the patient while in a state of abdominal pain, might be another contributing factor. The absence of pain following splenectomy resulted in complete recovery.

DIAGNOSIS AND TREATMENT

A diagnosis of splenic pain is somewhat difficult because the symptoms are similar to other conditions. The only pathognomonic symptom is pain on palpation of the splenic region in the absence of other conditions. Thus, a tentative diagnosis can be obtained by excluding other conditions and by the opacity of the enlarged spleen on the

radiograph. The diagnostic significance of an increased reticulocyte count is questionable.

Permanent relief from splenodynia can be obtained only by splenectomy. As described by Gray,[7] "The spleen may become displaced, producing great pain from stretching of the vessels and nerves, and this may require removal of the organ." Surgical removal is facilitated by the organ's location on the ventral abdominal floor where it is readily accessible by mid-abdominal incision. Since the ligaments are stretched, the spleen is easily lifted from the abdominal cavity, making the blood vessels at the hilus visible for ligation. The blood vessels should be ligated on either side of the point where they are to be divided, to prevent collapse of the organ upon removal. No evidence of surgical shock has been observed following splenectomy in this condition.

Concerning the effects of splenectomy, Dukes[8] states, "When the spleen is extirpated, other organs soon take over its functions or other adjustments are made, so that little or no disturbance of health ordinarily results." The author has not observed any abnormal postoperative effects from splenectomy performed because of splenodynia. Sections of the removed spleens reveal a capsule and trabeculae which appear to have been stretched. These tissues are thin in relation to the splenic pulp. The latter shows congestion and, in one case, a moderate lymphoid follicular hyperplasia.

SUMMARY

1) Three clinical cases are described to represent direct and indirect symptoms of splenodynia.

2) The origin of splenic pain due to changes in the size and position of the spleen which caused traction on the splenic ligaments is discussed.

3) The diagnosis of splenodynia, and the conditions that might complicate diagnosis are discussed.

4) Splenectomy requires relatively simple surgical procedures and produces little or no ill effects postoperatively.

5) Splenectomy is demonstrated to be an absolute corrective measure.

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Artificial Insemination Progress.—In 1939 there were, in this country, seven artificial breeding associations using 33 sires serving 7,539 cows in 648 herds. In 1952, units had increased to 1,623 involving 4,295,243 cows in 371,921 herds. An average of 1,848 cows per sire were inseminated. Bulls in service included 815 Holstein-Friesians; 614 Gurnseys; 436 Jerseys; 203 beef bulls; 144 Brown Swiss; and 92 Ayrshires.—*Ayrshire Dig., Sept., 1953.*

Dangers in the Use of Efocaine

Until recently, efocaine was believed to fill the need for a safe, local anesthetic with prolonged action. However, recently there have been clinical reports of sloughs, neuritis, paralysis, and now a death, attributed to the use of efocaine.

It was used as a nerve block in a man with a severe intercostal neuralgia. Injection was made in the right eighth intercostal space, well away from the spine. After 1.5 cc. of efocaine had been injected, the patient felt pain in his back which radiated down both limbs, then he suddenly collapsed with complete paralysis of the limbs. He died in forty-four hours. Autopsy revealed thrombophlebitis of the eighth intercostal vein, necrosis and inflammation of the spinal cord, and petechia of the pons and medulla. The efocaine may have reached the cord through intercostal vessels or the perineural sheath. It is recommended that efocaine not be used for local anesthesia, especially near a vital organ.—*J. Am. M. A., Oct. 10, 1953.*

Calcified Intestinal Nodules in a Dog

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New Haven, Connecticut

A MALE wire-haired Fox Terrier, 7 years old, had been under my observation for five years. The dog had an undescended right testicle which could be palpated in the inguinal region. The left testicle could not be palpated and a cryptorchid condition was suspected.

The dog was presented on July 2, 1952, suffering from a gastric disturbance. During the acute attack, which had occurred in another city, the dog had been taken to a veterinarian who had radiographs made. The owner was advised that the dog had a tumor in the abdominal cavity requiring operation, and that the radiographs showed numerous small bones in the intestinal lumen. Desiring to have another opinion on the case, the owner took the radiographs to a radiologist who concurred.

An examination disclosed a slightly enlarged prostate and several small cutaneous granulomata on the head and body. On the same day, dorsoventral and lateral radiographs (fig. 1, 2) were taken which showed numerous radiopaque nodules in the abdominal cavity, varying in size from a pinhead to a small pea. After comparing these radiographs with the ones brought by the owner, I concluded that the radiopaque nodules were not particles of bones in the intestines, but were calcified nodules embedded in the intestinal wall. (The dog had 8, instead of 7, well-developed lumbar vertebrae.) Barium radiographs were taken the next morning. The dog was starved for twenty-four hours, followed by a thorough intestinal lavage which removed a quantity of grass. About ½ oz. of barium was given in 4 oz. of water orally, and three hours later 1 oz. of barium mixed with 8 oz. of water was introduced rectally through a high enema. These radiographs did not show any tumification in the abdomen, but did show the same numerous calcified nodules as in the flat radiographs.

Available literature did not disclose any similar radiographs, so it was decided to study the case further. The nodules were suspected of being caused by tuberculosis or histoplasmosis. A radiograph of the thorax and abdomen taken nine hours after the oral administration of barium showed no nodular calcifications in the thorax. The dog was tested for histoplasmosis by injecting a few drops of histoplasmin (1:100) in the cervical region intradermally, and for tuberculosis by a double intradermal test in the thoracic and caudal regions. Readings of both tests were made every twenty-four hours for four days. Both tests proved negative. Urinalysis and blood examinations revealed nothing abnormal and the fecal examination for parasites was negative.

Inasmuch as the dog's prostatitis was not serious and as the digestive disorder, probably due to ingestion of grass, had been relieved, the dog was sent home with suitable diet instructions.

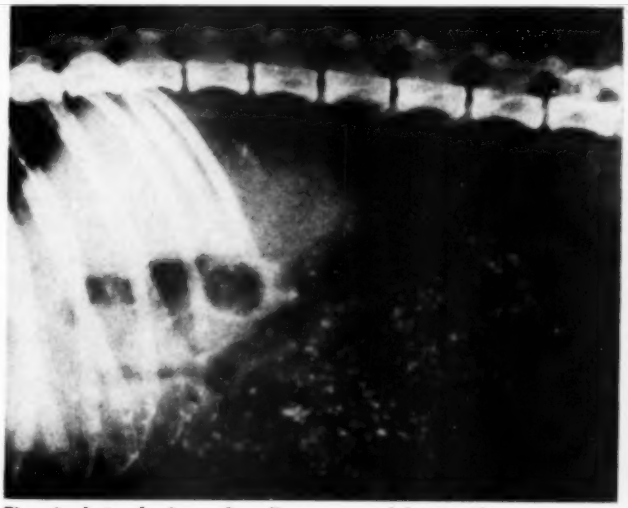

Fig. 1—Lateral view of radiopaque nodules in the abdominal cavity.

Dr. Jonas is a practitioner in New Haven, Conn.

The author sincerely thanks Drs. R. N. Lowman, x-ray department, and I. L. Waters, pathology department, Grace-New Haven Community Hospital; and H. Chernoff, internist, New Haven, for having contributed in the preparation of this paper. He is also grateful to the staff members of the departments of parasitology, pathology, and radiology at the Ontario Veterinary College; pathology at the University of Connecticut; and microbiology and pathology at Yale University.

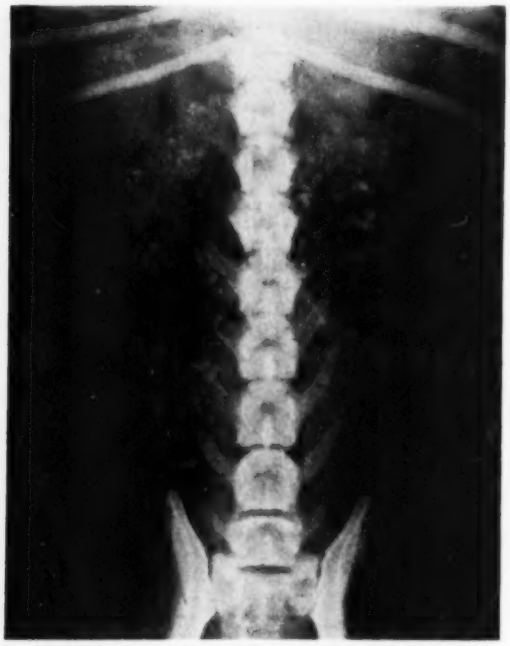

Fig. 2—Dorsoventral view of nodules in the abdominal cavity. Note numerous radiopaque nodules embedded in the intestinal wall, and eight lumbar vertebrae.

On August 4, thirty-three days after the dog was first presented, he was brought in again mainly because one of the small granulomata on his head had become traumatized and was bleeding. At that time it was decided to remove the granuloma and to proceed with laparotomy and castration. The right testicle, which was about half the normal size, was removed without difficulty. A laparotomy was then performed by making an incision about 2 in. long in the linea alba between the prepuce and the umbilicus, and the cryptorchid testicle, which was located in the left lumbar region, was removed. The abdomen was explored and the nodules located. Sections of the small intestines were brought out through the incision and examined macroscopically. They were found to be thickly studded with hard, yellowish white nodules, ranging in size from a pinhead to that of a small pea, occasionally joined together to form a cluster.

Fig. 3—Calcified nodule with necrotic center.

The nodules were located in the intestinal wall between the serosa and longitudinal muscle. Two nodules were resected, the area was touched with a thermacautery, and 50,000 units of aqueous penicillin in normal saline was given intraperitoneally. The abdominal incision was closed by using catgut sutures through the peritoneum and muscles; silkworm sutures were used in the skin as well as for two reinforcing sutures through skin muscle and peritoneum. The dog was given a light diet and 300,000 units of procaine crystalline penicillin G in aqueous suspension once daily for three days. The sutures were removed on the seventh day. The dog maintained a normal temperature, appetite, and elimination, and was discharged in apparently perfect health eleven days after the operation.

The cryptorchid testicle, which was about three-fourths of the normal size, and one nodule were placed in a 10 per cent formaldehyde solution and sent to the pathology department of Yale University for sectioning and examination. The other nodule was placed on ice and given to the bacteriology department of Yale University for culture. The report from the pathology department reads: "For testis — interstitial cell tumor. For nodule — calcified nodule with necrotic center." The department of bacteriology reported that the nodule was sterile.

The slides were then sent to the veterinary pathology department of the University of Connecticut at Storrs with a report on the case. The findings there concurred both as to the interstitial tumor of the testis and the nodule. They reported: "The nodule seems to be largely calcified and shows clefts of perhaps fat crystals, but no definite causative organism. A diagnosis would be impossible but . . . some metabolic disturbance, perhaps fat necrosis" was suspected.

The sections and five radiographs were then sent to the departments of parasitology and of pathology, Ontario Veterinary College, for interpretation. A letter from the College states: "We know of no similar cases to that of yours which have been reported among animals." A later communication states that they had "reviewed a considerable amount of literature, but had been unable to find illustrations of calcium deposits in adenomatous- carcinoma secondaries."

The radiographs were then taken to the x-ray and pathology departments of the Grace-New Haven Community Hospital for interpretation. They knew of no reports of a radiograph of calcified nodules localized in the intestinal wall due to fat necrosis, metabolic disturbance, malignancy, or other disorders, similar to those presented in this case and concluded that "calcification in nonspecific parasitic cyst would best explain the pathological appearance."

An internist was of the opinion that in fat necrosis secondary to pancreatitis, there would not be such a relative uniformity in size and distribution of calcium as seen in the radiographs, and the calcium deposits would be located in the peritoneal surface rather than between the serosa and longitudinal muscle of the intestines. He considered metabolic disturbance as very unlikely because in that case the deposits of calcium would be widespread throughout the body and not limited only to the intestinal wall.

The picture of a disease most nearly resembling this case is given by Hutyra and Marek[1] describing nodular disease. They state that: "In the most recent nodules there can also be found Oesophagostomum larvae 3 or 4 to 7 mm. long" indicating the probability that old arrested cases would no longer harbor larva. So far, esophagostomiasis has been reported only in sheep, cattle, deer, goats, and occasionally in the pig, in monkeys, and in man, but not in the canine species.

When last checked, one year after the first radiograph was taken, the dog was found in apparently good health.

SUMMARY

This paper describes a nodular disease in a dog probably due to parasitism, perhaps of the Oesophagostomum type. Although the causative agent has so far not been detected, the fact remains that this is a case of multiple calcified nodules in the intestinal wall of the dog, for which we have evidence in radiographs, slides, and through macroscopic observation during laparotomy.

[1]Hutyra, Franz, Marek, Joseph, and Manninger, R.: Pathology and Therapeutics of Domestic Animals. Alexander Eger, Chicago, (1926):395.

Probable Leiomyosarcoma in a Lion (*Felis Leo*)

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Madison, Wisconsin

The male lion, "Army," was born in 1939 in a private zoo in North Dakota. He was received at the Racine Zoölogical Park on March 13, 1946, when male specimens were exchanged for new blood stock.

In January, 1952, a slight raised area was first observed in the posterior lumbar region. Two months later, the mass had grown and approximated the size of a golf ball. On June 10, the lion was examined and it was decided to remove the mass which had then attained a size comparable to a man's fist. On the morning of June 17, the keeper gave the 450-lb. lion six capsules (hidden in meat) of pentobarbital sodium, 1.5 gr. each, as a basal anesthetic. This quantity of pentobarbital sodium produced sufficient depression so that in two hours the animal was easily driven into an alleyway, crowded into a corner, and roped. Ether anesthesia was begun and 3.5 lb. of ether was required for the 35-minute operation. The tissue mass was localized at the posterior, medial, lumbar region, about 25 cm. from the base of the tail. Although the mass was embedded mainly in the subcutaneous tissue, it had also invaded the skin from which it had to be dissected. The removed mass measured approximately 12 by 13 by 8 cm.

A portion of the tumor was submitted to the disease control laboratory of the State of Wisconsin Department of Agriculture and the histopathological diagnosis made

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From the Wisconsin Department of Agriculture (Krohn); Racine practitioner (Newman); zoölogical director (Rokosky), Racine Zoological Park; and Department of Veterinary Science, University of Wisconsin (Simon).

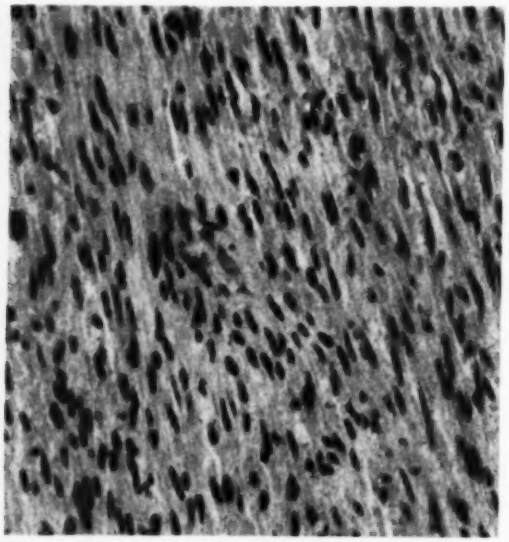

Fig. 1—Section of a leiomyosarcoma in a subcutaneous nodule of a lion, stained with hematoxylin-eosin. x 350.

at the time was that of an anaplastic sarcoma.

Approximately five weeks following surgery, proliferation of tissue was evident at the original wound site. This mass continued to grow and on Nov. 1, 1952, it had again attained the size of a man's fist. Since the animal's condition became progressively worse, including atrophy of the posterior limbs, euthanasia was performed on Dec. 5, 1952. Sedation was induced by the administration of 12 capsules of 1.5 gr. each of nembutal,® after which he was shot between the eyes with a .22 caliber rifle.

Unfortunately, an autopsy was not performed but a number of the smaller subcutaneous nodules were submitted for additional study. These nodules were fixed in 10 per cent formalin.

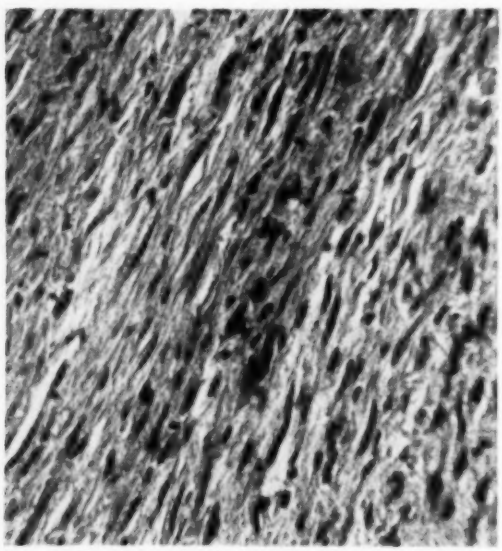

Fig. 2—Section of a leiomyosarcoma in a subcutaneous nodule of a lion, stained by the modified Shorr's procedure. x 350.

PATHOLOGY

Gross.—The nodules present in the subcutaneous tissue of the lumbar region appeared to be well encapsulated, measured approximately 3 cm. in diameter, and were incised with considerable difficulty. A central zonal area of necrosis was present in some of the nodules. Pieces of tissue were saved from the nodules for microscopic study.

Microscopic.—Tissue sections were cut at a thickness of 7 μ and stained with hematoxylin and eosin. Microscopic examination revealed an extremely cellular tissue composed of elements similar to smooth muscle type cells. Many of the nuclei of the cells were hyperchromatic and were undergoing mitotic division. Some of the neoplastic tissue was arranged in whorls which simulated a fibroblastic proliferation with a tendency to invade the surrounding connective tissue. Necrotic foci and an inflammatory exudation of polymorphonuclear leukocytes were evident in some microscopic fields. Resemblance to myxomatous change was striking in some of the fields studied.

Since the tumor was relatively anaplastic, differential staining techniques were employed in an effort to further classify the neoplasm.

The staining reaction with modified Shorr's stain* suggested that the tumor mass consisted of smooth muscle elements. The cytoplasm of the tumor cells was stained yellow with Van Gieson's staining technique[1] which indicated that the tumor consisted of smooth muscle elements. It is believed that this neoplasm represents an anaplastic leiomyosarcoma (fig. 1, 2).

CONCLUSION

It is reasonable to assume that metastatic tumor masses could conceivably account for the rapid downhill course of this animal. It is further recognized that without an autopsy, the distribution, degree of organ involvement, and the primary site of this neoplasm will never be known. Furthermore, the primary site of a neoplasm can not always be ascertained.

*Single solution triple stain (a modification of Shorr's stain with acid fuchsin instead of Bieberick scarlet).

[1]Lillie, R. D.: Histopathologic Technique (1948); 190-191.

A Note on the Use of Surital Sodium Anesthesia in Swine

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THE NEED for a satisfactory anesthetic in swine practice has long been recognized by veterinary surgeons and research workers throughout the nation. Until recently, most of the anesthetics available seemed to be contraindicated in some phase of application. They proved to be either toxic, resulting in frequent deaths, or the duration of anesthesia was too long and incurred time-consuming attention following an operation. Floundering and struggling associated with recovery from anesthesia of long duration occasionally defeated the purpose of the operation. Immobility for several hours also predisposed animals to respiratory infections when conditions were not ideal, particularly if the animal was subjected to chilling. In addition to being relatively toxic, anesthetics of short duration usually required the individual attention of a trained person to control the action of the drug. Thus, ease of application, low toxicity, and short duration of anesthesia ranged uppermost in the consideration of any anesthetic for swine. With these factors in mind, and upon the advice of our colleagues who used the drug successfully in small animal surgery,[1] it was decided to evaluate surital sodium in swine research.

METHODS

Surital sodium was administered by either of two routes; *i.e.*, by injection into the anterior vena cava or into the peritoneal cavity. The weight of the pigs was estimated and the drug administered at the rate of 1 cc. of a 4 per cent solution of surital sodium in sterile physiological saline for each 5 lb. of body weight.

For anterior vena cava administration, the animal was placed in a dorsal recumbent position. The front legs were drawn posteriorly and the head pressed down to the table level, exposing tightened skin and muscle over the cervical area. A 2- to 3-inch, 16-gauge needle on a 20-cc. glass syringe was inserted parallel, but approximately ½ inch lateral, to the anterior point of the sternum. The needle was directed slightly posterior, medially and dorsally toward a point midway between the shoulder blades. When the anterior vena cava was entered and positive entry determined by the appearance of blood in the syringe under slight negative pressure, the solution was injected rather quickly to within 1 cc. of the estimated dose. The balance was given slowly as the degree of effect was determined. The injection was continued until the desired stage of anesthesia was achieved. Intraperitoneal injections were much easier to administer than the intravenous injections, but were more difficult to regulate. Animals were suspended head down for the intraperitoneal administration and the solution was injected into the lateral posterior portion of the abdomen. This reduced the possibilities of injecting the anesthetic into the lumen of the intestine. As before, the dosage was estimated at 1 cc. of a 4 per cent solution for each 5 lb. of body weight. Animals were observed for five minutes for evidence of developing anesthesia. If at the end of this time they were still active and showed no signs of incapacitation, a repeat injection of 1/3 of the original dose was given. In the event that this second administration did not prove effective within another ten minutes, the pig was injected intravenously until adequate anesthesia was achieved.

RESULTS

More than 200 swine weighing 25 to 70 lb. were injected, using these procedures. Anesthesia was complete and lasted approximately ten to twelve minutes. The animals recovered quickly following this period and within thirty to forty minutes following the onset of anesthesia were again standing. The animals were slightly depressed, but much of that depression was associated with surgery. The drug had no apparent toxic effect upon the cardiac system and only moderate toxic effect upon the respiratory system. In marked overdosage, the anesthetic acted as a respiratory depressant.

Overdosage, probably as the result of inaccurate weight estimation, occurred in less than 3 per cent of the cases. Each of these cases was characterized by the cessation of respiration, but the continuation of strong heart action. No losses occurred when prompt manual artificial respiration was applied. Since the drug was detoxified

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[1]Brinker, W. O., Eads, F. E., Sales, E. K., Schirmer, R. G., and Wheeler, A. C.: Surital Sodium: A New Agent for Intravenous Use. Vet. Med., 46, (1951):31.

so quickly, the maximum period that artificial respiration had to be continued was not more than fifteen minutes. The only mortality associated with the use of surital sodium resulted when 1 animal ceased breathing unnoticed and was allowed to suffer from anoxia. It appeared evident that if artificial respiration was applied within sixty seconds following respiratory failure the animals would recover. How much longer a pig could endure respiratory inactivity and live was not determined.

SUMMARY

Surital Sodium has been used successfully in more than 200 swine. The duration of anesthesia was short, making the use of the drug ideal for minor operations. The ease of administration of the anesthetic rendered the aid of a trained anesthetist or assistant unnecessary. The relative nontoxicity decreased the danger of death during anesthesia. As the result of quick elimination of the drug, recovery was rapid with few postoperative complications from its use.

Human Uterine Inertia

A hospital reports on 158 cases of prolonged labor, 0.8 per cent of its 19,159 deliveries. There were no maternal deaths in this group but 33 (21%) infant deaths. Uterine inertia was the major cause, occurring alone in 77 per cent and being a factor in all except three cases. Fetal pelvic disproportion was a factor in 31 cases, and half of these babies were lost. The age and parity of the mother were significant, 85 per cent being primiparas and 45 per cent being under 20 years of age. When labor, counting from the time uterine contractions became painful, lasted forty-eight to sixty hours there was an infant mortality of 21 per cent; when it lasted over sixty hours, infant mortality rose to 54 per cent. Except for two premature births, maternal fever, which increases the oxygen requirement of the infant, had developed in all the women who lost their babies. One-third of the mothers developed a fever, 14 of them within the first twelve hours of labor. In 16, who had fever more than thirty-six hours before delivery, the infant loss was 13 (81.2%). In their later pregnancies, cesarean section was required in over 50 per cent of those whose prolonged labor had been due to fetal pelvic disproportion, whereas later deliveries were spontaneous and prompt in the primary uterine inertia group.—*J. Am. M. A., Oct. 24, 1953.*

Research in Semen Storage

Bull semen, containing 10 per cent glycerin and stored at a −79 C. for eleven months to a year, produced a 75 per cent conception rate in 32 cows, an above average rate. Seven of 12 cows were fertilized with semen similarly diluted 1:100 and frozen at −79 C. for two to twenty-four days. By using liquid air in place of CO_2, 1:4 diluted semen was frozen at −192 C., and 2 cows inseminated with semen stored fifteen months revealed fertilized ova when slaughtered two days later.—*Vet. Rec., Oct. 24, 1953.*

Research on Ovine Vibriosis.—Vibriosis, which caused at least 50,000 abortions in Colorado sheep last year, and similar losses in mountain states in recent years, will be investigated at Colorado A. & M. College and five coöperating experiment stations to learn if it is being transmitted by rams and whether effective therapy is possible.—*Feed Bag, Oct., 1953.*

Inbreeding increases homozygosity while outbreeding increases the heterozygosity of offspring.—*Lester Gilmore, Ph.D., Wooster, Ohio.*

Environment will not cause a cow to produce beyond her inherited ability but poor environment prevents a cow from producing to the limit of her inherited ability.—*R. E. Hodgson, Asst. Chief, Bureau of Dairy Industry.*

An Unusual Birth of Twins

Twin pregnancy in a double uterus was diagnosed in the mother of two children in September, 1952. In December, a 2-month premature living infant was uneventfully delivered from the right uterus. The fetus in the left uterus was in breech position at the commencement of labor but had undergone spontaneous version and was in normal vertex position after delivery of the first twin. The second twin was not born until fifty-six days later, a world's record for intervals between twin deliveries. Lactation did not occur until after the second delivery.—*J. Am. M. A., Oct. 10, 1953.*

Arthrodesis in Traumatic Plantar Subluxation of the Metatarsal Bones of the Dog

GUNNAR ARWEDSSON, V.M.D.

Stockholm, Sweden

AMONG THE accidental injuries occurring in the tarsal region of dogs, plantar subluxation of the metatarsal bones in the tarsometatarsal joint appears, from a prognostic point of view, to be most unfavorable. What makes this condition so difficult to treat is the damage to the plantar tarsal ligaments. These ligaments, which are subjected to severe strains, form a strong ligamentous apparatus.

The topography of the plantar ligaments, which are damaged to a greater or lesser extent, is in some measure clarified by figure 1.

In this subluxation, the limb seen from the side shows an angle-formation at the level of the joint in question, with the point of the angle directed backward. The roentgenogram discloses that only the dorsal joint edges of the metatarsal bones have contact with the corresponding joint surfaces of the tarsal bones (fig. 2a). In the acute stage, the dog shows a high-grade lameness with abnormal mobility of the tarsometatarsal articulation. The diagnosis should be confirmed with a roentgenogram.

An examination of the records of the Department of Surgery, Royal Veterinary College, Stockholm, for the twenty-year period of 1930-1949, reveals only 5 cases of plantar subluxation of the metatarsal bones in the dog. Of these cases, 3 were given conservative treatment only, with plaster or other supporting bandages. In 2 cases, the dorsal tarsal ligament was sectioned to facilitate reposition. Also in these cases, supporting bandages were used. The methods did not prove satisfactory, since permanent lameness resulted.

Bearing in mind that movement of the tarsometatarsal articulation is of subordinate importance, we decided to try arthrodesis. This procedure has been used in 3 cases in the Department of Surgery in recent years. As it has given good results, it may be of interest to describe the operative technique, in spite of the limited number of cases.

From the Department of Surgery, Royal Veterinary College, Stockholm, Sweden.

THE OPERATION

The operation is carried out under epidural anesthesia. The patient is laid on one side with the affected leg upward. Then the hair in the tarsal region is cut and the area disinfected. A skin incision is made on the plantar surface of the tarsus somewhat laterally to the tendon of the superficial digital flexor muscle and parallel with it. The incision should be about 6 to 7 cm. long (in a middle-sized dog), and the middle of the incision should be at the level of the

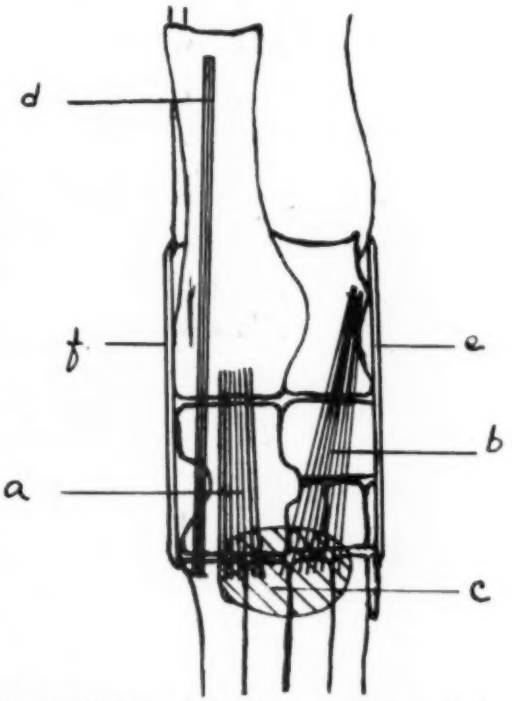

Fig. 1—Diagram of the plantar ligaments and the long lateral and medial ligaments of the hock joint in the dog: (a) the plantar ligament (l. tarsi plantare); (b) the distal medial ligament (l. collaterale mediale distale); (c) the deep plantar sesamoid fibrocartilage (fibrocartilago sesamoidea plantaris profunda), which is attached by a number of bands to the tarsal and metatarsal bones; (d) the tendinous part of musculus abductor digiti quinti. The l. interordinaria (not shown in the diagram) were also damaged, as were (e) the long medial ligament (l. collaterale mediale longum) and (f) the long lateral ligament (l. collaterale longum).

tarsometatarsal articulation. Fascia and ligaments that are not completely ruptured are cut through and the joint capsule opened. One assistant should grasp the limb, with one hand proximally and the other distally to the incision, and flex it dorsally so that the joint cavity fissure widens plantarly. With an electric drill, the articular cartilage is removed from the bones in the joint. All cartilage should be removed as even the slightest remnant can delay bone fusion. This phase of the operation is followed by reposition and fixation. The replacement of the subluxated parts does not usually involve any great difficulties.

Before the joint capsule, fascia, and skin wound are sutured, fixation is started. The transfixation plastering used is chiefly applied to certain types of fractures (G. Björck, *Nord. Vet-med.*, *4*, (1952): 89-115).

Figure 3 illustrates the principle of transfixation plastering. Two stainless steel pins about 11 cm. long and with a diameter of 2 to 4 mm., depending on the size of the dog, are driven from the lateral side into the fibular tarsal bone, penetrating the surrounding soft parts. The pins are placed at right angles to the longitudinal axis of the bone. One pin is driven through the tuber calcis and the other through the body. The metatarsal bones are pierced in a similar manner with two pins, one being placed near the proximal and the other near the distal ends.

Now, final reposition follows and one must make sure that the surfaces of the bones come in complete contact with each other. A perforated aluminum plate is placed on the medial side and the pins are passed through suitable holes in the plate to prevent dislocation during the following manipulations. The joint capsule and fascia are now sutured with catgut and the skin with metal. On the opposite side to the aluminum plate, a longitudinal plaster cast is placed, uniting the pins. When the plaster has hardened, the aluminum plate is taken away and a plaster cast applied to unite the pins on this side. When this

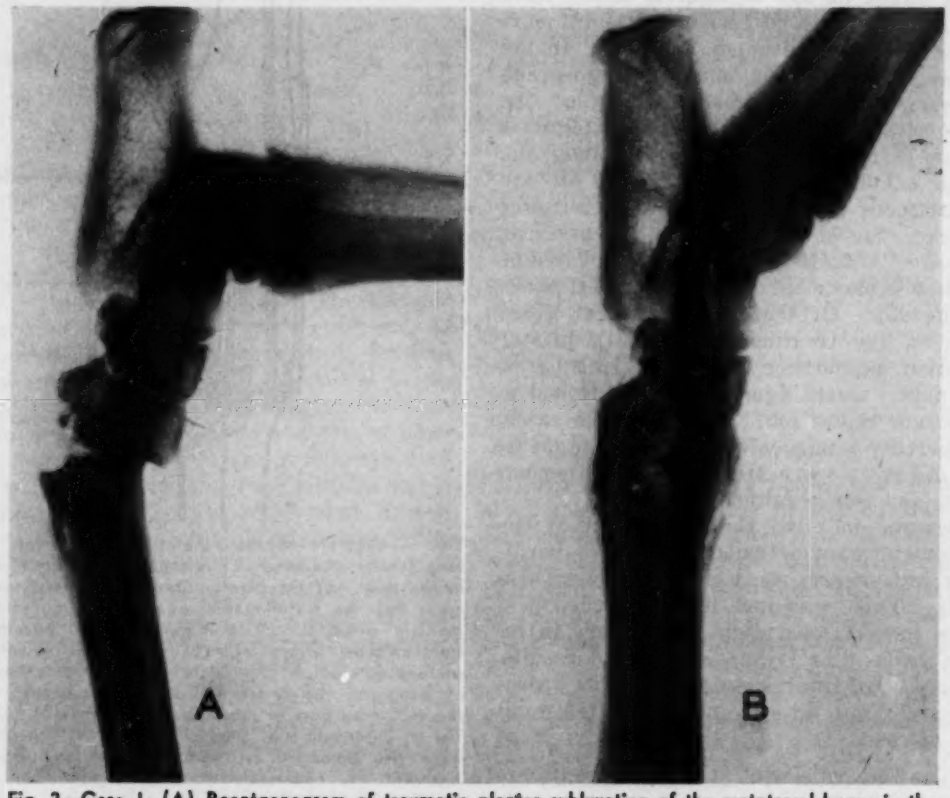

Fig. 2—Case 1. (A) Roentgenogram of traumatic plantar subluxation of the metatarsal bones in the dog. (B) Roentgenogram about two years after arthrodesis.

plaster also has hardened, a thick layer of cotton wool is placed dorsally and plantarly to allow for expansion of the soft parts. Around the cotton wool and the longitudinal plaster bridges a circular plaster cast is applied.

The reposition is checked by roentgenogram. To prevent the dog biting the plaster cast, a collar of cardboard or plywood is provided.

The plaster bandage and pins are removed five to six weeks after the operation. The dog is then discharged and cautious exercise is allowed. Inquiries disclosed that the dogs treated with arthrodesis were lame for about two months after they were discharged. After this, a rapid recovery occurred and the lameness disappeared.

All the cases treated were examined in March, 1953. The observation time then for case 1 had been about two years, for case 2 about one year, and for case 3 about ten months. The dogs showed no lameness when either walking or running. On palpation, a slight tumefaction was perceptible around the tarsometatarsal articulation treated with arthrodesis. There was complete ankylosis in the joint. Roentgenograms showed an almost complete fusion of the distal row of the tarsal bones and the metatarsal bones in case 1 (fig. 2b). In cases 2 and 3, the joint cavity on the roentgenograms was seen to be incompletely obliterated.

In cases 1 and 2, the owners said that the dogs appeared to spare the operated leg when it had been subjected to great exertion. The third dog had been used for draught purposes in the mountains without showing any impediment in its movements. In case 1 the owner had to destroy the dog for economic reasons and the author was

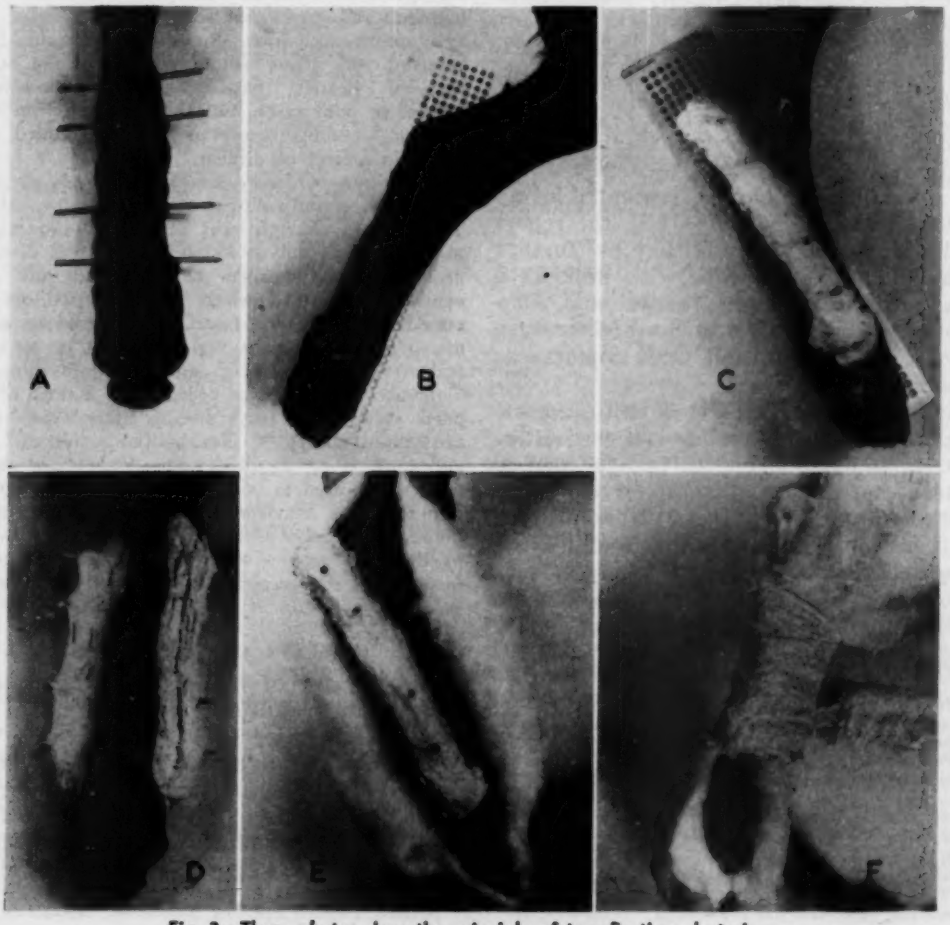

Fig. 3—These photos show the principle of transfixation plastering.

able to make a histological examination. The bones concerned were found to be completely fused except for a gap about 1 mm. long.

SUMMARY

A method for operative treatment of plantar subluxation of the metatarsal bones in the dog is outlined, conservative treatment of that condition having proved to have a poor prognosis. By removing the articular cartilage on all the bones of the tarsometatarsal articulation and then fixing the parts concerned by transfixation plastering, arthrodesis was achieved. Three cases have been subjected to this treatment at the Department of Surgery, Royal Veterinary College, Stockholm, and the results were most satisfactory.

Pasteurized Skimmilk as a Bovine Semen Diluent

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W. B. DURRELL, D.V.M., M.S.

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With the rapid growth of artificial insemination in dairy cattle, research workers are attemptng to improve present diluting agents for bull semen. In 1950, the report from Czechoslovakia by Michajilov[1] further stimulated research work with milk as a possible diluting agent. Thacker and Almquist[4] have presented a review of literature on the use of milk and milk products as semen diluters.

Egg yolk buffer diluter[2] is still the basic extending agent in commercial use. However, it is cumbersome to prepare and is quite expensive. If milk diluter can offer similar or improved results, it will find a ready market. The objective of the following experimental work was to further evaluate pasteurized skim milk in comparison to egg yolk buffer as a semen diluent.

EXPERIMENTAL

Preliminary trials indicated pasteurized skimmilk heated to 95 C. for eight minutes maintained livability and motility of spermatozoa equal to control samples of yolk-citrate diluted semen under refrigeration. An aluminum double boiler with a small hole drilled in the cover to allow a centigrade thermometer to stand upright in the milk was used for heating the skimmilk. In the first trials, the milk was heated over water in the base of the double boiler. Later, ethylene glycol was substituted for water in an attempt to provide more rapid heat. This method proved satisfactory and was used throughout the trial. Filtering was unnecessary since there was usually little or no scum on the heated milk. As a result of *in vitro* trials, skimmilk-diluted semen was shipped to several technicians in the field, along with duplicate yolk-citrate samples. Early results were encouraging and the following experimental work was started July 1, 1952, and continued until Nov. 13, 1952.

Technicians working for a local coöperative* were divided into two equal groups in such a way that expected numbers of Jersey first-services might be approximately equal for both groups. No special instructions were given for methods of handling and storing the semen. By means of the split-sample technique, one group of technicians received yolk-citrate-diluted semen and the other received heated, pasteurized skimmilk-diluted semen. In both cases, 500 I. U. of penicillin and 500 μg. of dihydrostreptomycin were added per cubic centimeter of diluent.

Collections of Jersey semen were made directly into 10 cc. of milk diluent warmed to 30 to 35 C. The resulting sample was immediately examined microscopically and if found suitable was divided proportionately between the milk and yolk diluents. The diluted semen was processed, refrigerated for about one hour, and shipped to technicians. Dilution rates varied from 1:10 to 1:50 and were approximately equal for both diluents. Yolk-citrate diluter was prepared in a ratio of 45 parts yolk to 55 parts sterile diluent consisting of sodium citrate 30 Gm., sulfanilamide 3 Gm., and 1,000 cc. of distilled water. Pasteurized skimmilk was heated to 96 to 100 C. for ten to fifteen minutes over ethylene glycol in the aluminum double boiler. On Oct. 2, 1952, semen shipments to the two groups were reversed so that technicians formerly receiving milk-diluted semen were receiving yolk-diluted and vice versa.

RESULTS AND DISCUSSION

A summary of the sixty- to ninety-day nonreturns resulting from the trial is presented in table 1.

During preliminary trials in the field, it was evident that many technicians preferred to use skimmilk-diluted semen. After evidence was available that the breeding efficiency was slightly lower with milk,

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The authors thank Albert J. LaCasse, David P. Newton, and Frederick Gardner for their assistance and coöperation in technical work with this experiment.

*Central Vermont Breeding Association, Montpelier.

some resistance was encountered from technicians.

On two occasions, bacterial colony counts were made on milk-diluted and yolk-diluted semen. In both cases, bacterial numbers were somewhat larger in the milk group.

TABLE I—Summary of First Services Using Skimmilk- and Egg Yolk-Diluted Semen with Percentage of Nonreturns on the Sixty- to Ninety-Day Basis

	Egg		Milk		Difference
1952	Firsts	(%)	Firsts	(%)	(%)
July	573	68.24	538	64.68	3.56
Aug.	246	70.73	240	65.42	5.31
Sept.	325	71.69	400	67.75	3.94
Oct.	411	73.24	316	68.35	4.89
Total	1,555	70.68	1,494	66.40	4.28
"t" value	10.8				

Although inconclusive, this finding would suggest that a higher bacterial population may have contributed to lower efficiency with the milk. A statistical analysis of the percentage of nonreturns shown in table 1 with Student's "t" test[3] gave a value of 10.8 which indicated the results were highly significant.

SUMMARY

Following preliminary trials in the laboratory and later in the field, heated, pasteurized, skimmilk was used as a semen diluent in comparison with yolk-citrate diluter. The split-sample technique was used in a comparison of 3,049 cows inseminated on this basis. The sixty- to ninety-day nonreturns averaged 70.68 per cent for the yolk-citrate group and 66.40 per cent for the heated, pasteurized, skimmilk group. When examined statistically with Student's "t" test, the difference in favor of yolk-citrate was found to be highly significant.

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Irradiation Effect on Male Rabbits

Research by the Atomic Energy Commission at Oak Ridge, Tenn., indicates that full body exposure of male rabbits to mild quantities of x-rays does affect their fertility. Eight males were bilaterally exposed to three levels of radiation while 3 remained as controls. Breeding commenced as soon after irradiation as possible. The ability of the sperm to fertilize was not affected.

The fetal mortality, which normally may be 10 per cent, was 0 for the controls but 32.7 per cent for those treated. The differences between the number of fetuses and the number of corpora lutea, expressed as percentages of eggs missing, was 20.3 per cent in the control group and 31.8 per cent in the irradiated group, the greater loss in the test group probably being due to early fetal death. However, there was no trend toward a higher loss with a higher dose of irradiation. While all males were fertile at first, 3 of those treated became sterile in fifty to ninety-five days. The number of stillborn was 4.3 per cent in the control group and 11.1 in the irradiated group. This data suggests that extreme caution should be exercised in exposure of males to irradiation.—*Science, June 27, 1952.*

Glycerination of Bull Semen

The addition of glycerin to semen increases its fertility in the case of some bulls (*Vet. Rec.*, Sept. 26 and Oct. 24, 1953). Ten per cent glycerin was added to two lots of serum from the same 9 bulls, with a significant increase in fertility in the case of 4 animals. The conception rate with untreated, fresh semen from these bulls was 59.3 per cent. When 10 per cent glycerin was added, it was 67.0 per cent.

The average for the other 5 bulls was: untreated, 66.0; glycerinated, 66.7. It is suggested that, like antibiotics, glycerin seems to improve those with low conception rates rather than those with satisfactory rates.

Eggs Marketed by Slot Machine.—An Alabama farmer with 2,000 producing hens has set up an egg-vending machine near a busy highway. It holds 15 dozen each of small, medium, and large eggs so that customers can take their choice.—*Farm J., Dec., 1953.*

Rumenotomy Simplified

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Erie, Pennsylvania

Veterinarians who have attempted to do a rumenotomy without adequate assistance probably would have appreciated the help of a simple rumen retractor. The instrument herein described makes it possible to do a rumenotomy without assistance and also lessens the probability of contamination of the skin and abdominal muscles. Furthermore, it is simple in construction, easy to clean, and provides ample space through which to remove rumen contents and conduct the reticulum exploration.

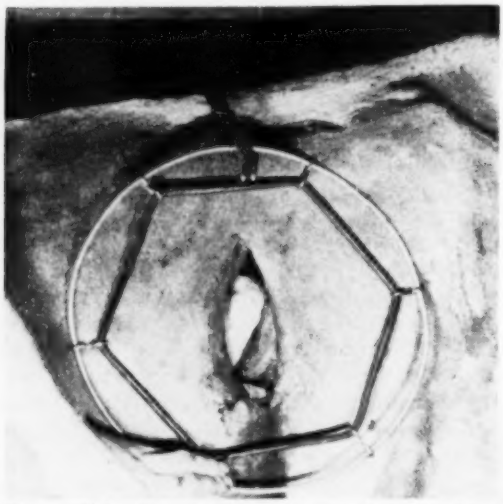

Fig. 1—This shows the usual rumenotomy incision through the abdominal wall with the ring in place.

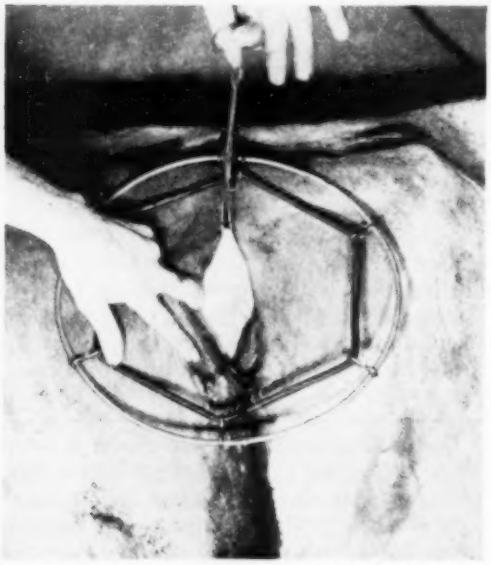

Fig. 2—The rumen is drawn through the flank incision with a towel clamp.

Fig. 3—The rumen incision with two hooks in place.

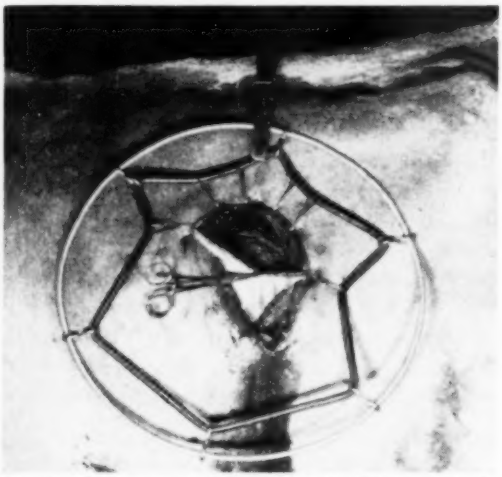

Fig. 4—The rumen incision enlarged with more hooks in place.

The instrument consists of an aluminum ring with a rubber ring attached to its inner circumference. This double ring is suspended by a web strap attached by a spring clip to the skin on the right side of the cow. To the rubber ring, a series of hooks is attached, the hooks being sharp-

Drs. Michael and McKinley are practitioners in Erie, Pa.

Fig. 5—The incision complete with all hooks in place.

pointed and turned in such a manner as to facilitate their insertion into the margins of the incision in the rumen. With these hooks attached, the margins of the rumen incision are retracted from the abdominal cavity and lapped 1 to 2 inches over the margins of the skin incision, creating the desired opening.

Figures 1 to 8 illustrate the use of the instrument. Other steps in the operation are performed in the usual manner.

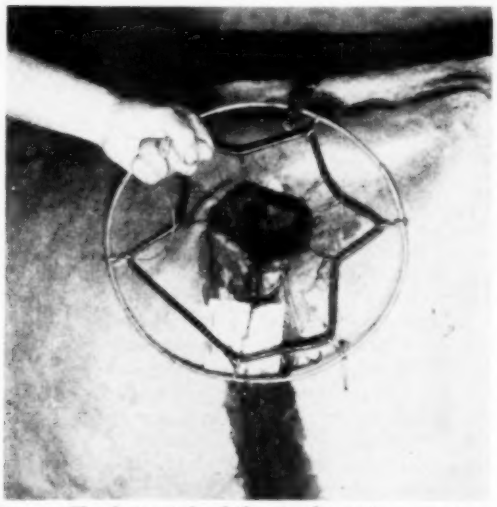

Fig. 6—The first stitch of the simple continuous suture has been placed, and the long loose end is tied to the aluminum ring to maintain the retraction on the lower end of the rumen incision. The hooks are removed as indicated to allow closure of the rumen.

Fig. 7—Simple continuous suture of the rumen completed and inverting suture begun at the upper end of the rumen incision.

Fig. 8—The lower end of the rumen incision is freed by cutting the loose end, and the inverting suture is completed.

Summary.—A new type of rumen retractor is described and the recommended procedure for its use is illustrated. The advantages of the use of the rumen retractor when conducting a rumenotomy are: (1) The rumenotomy can be completed without assistance; (2) the abdominal incision is well protected against contamination; and (3) the operation is simplified.

CLINICAL DATA

The Pathology of Osteogenic Sarcoma in Dogs

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THE OSTEOGENIC sarcoma represents a neoplastic growth of the bone-forming cells, the osteoblasts. The tumor is described more frequently in the dog than in other species of animal. In the dog, as in man, it affects the long bones most frequently, and its presence is characterized by a destruction of bone and infiltration of soft tissue.

The term "osteosarcoma," which is simpler and just as correct, is commonly used in French and German literature, while in English and American texts the preferred terminology seems to be "osteogenic sarcoma." This is presumably in analogy with the terms of "neurogenic sarcoma" and "bronchiogenic carcinoma," designating origin in the nerve sheaths and bronchi, respectively. Certain authors, however, define the osteogenic sarcoma as a sarcoma consisting of cells capable of producing bone, independent of the cell of origin. Primary bone-producing tumors located outside the skeletal system are frequently found in the canine mammary gland. An interesting example, with osseous metastases in the lungs, is described by Schlotthauer and Thurber.[17] The term "osteosarcoma" is desirable, particularly when the radiographic aspects of the tumor are taken into consideration. Radiographically, two main forms can be established — one, the osteolytic type, with a bone-destroying activity predominating; and the other, the osteogenic, osteoplastic, or sclerosing type, characterized by an extensive bone formation.

The purpose of this paper is to facilitate recognition clinically and pathologically by establishing some facts concerning the osteosarcoma and thus enable practitioners to make a more correct diagnosis and prognosis. A review of the literature is undertaken with the specific purpose of determining which of the long bones is most frequently involved, and to find out in which portion of the individual bone the tumor originated. A total of 33 cases were found and the information about these tumors is incorporated in table 1. The more significant of the references will be cited briefly.

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REVIEW OF LITERATURE

Coquot and Moussu[4] in 1927 found this tumor primarily involving the epiphyses of the radius, femur, tibia, and humerus. The lower end of the radius was most often affected. They had never seen involvement of the metacarpal, tarsal, and phalangeal bones. Metastases to internal organs were not noted, but lymph node metastases occasionally occurred. The majority of tumors were encountered in young dogs (2 were under 2 years of age) of the large breeds, Great Danes, Saint Bernards, Shepherds, and Pointers.

Berge[1] in 1931 described the osteosarcoma as occurring most commonly in the shaft of the long bones, with the epiphysis either intact or secondarily involved. Frequent findings in the tumor tissue were hemorrhages and hematomas, due to tumor infiltration of the blood vessels. The lack of demarcation was emphasized, together with the importance of roentgenological examination in differentiating this tumor from other bone lesions.

Feldman and Ford[7] in 1932 described a case of osteogenic sarcoma in the distal end of the ulna with secondary involvement of the radius in a 2-year-old male English Setter. Treatment with roentgen rays and amputation did not prevent development of numerous lung metastases six weeks postoperatively. The amputation was done at the proximal third of the humerus about six months after the tumor was first noticed.

Bloom[3] in 1932 described 2 cases of this tumor. The first subject, a 2½-year-old male Saint Bernard, was observed from the time lameness and a sensitive, slight swelling on the medial aspects of the distal third of the radius was first noticed, until euthanasia was administered two months later. Radiographs showed cancellous bone destruction, with some radiating periosteal bone proliferation. The autopsy revealed no lung metastases and microscopically the tumor consisted of actively proliferating masses of rudimentary cartilage and osteoid tissue, with many mitotic figures present. The second case, a 3½-year-old male Eng-

lish Bull Terrier, showed extensive involvement of the distal half of the radius, with marked destruction of cortex and medulla, and some involvement of the ulna. Only slight lameness was noticed and the animal was reported in apparent good health.

Schnelle[15] in 1950 stated that the Great Dane is the breed most frequently affected. The range in age is from 3 to 11 years, with a definite peak around 5 to 6 years. The bones predominantly involved are the epiphyseal ends of the humerus, radius, and tibia. Early metastasis may be expected and usually involves the lungs.

MATERIALS AND METHODS

The basis for the study recorded here consists of 20 cases of canine osteosarcoma seen in the past two years at the Ontario Veterinary College. Seventeen of these cases were brought to the Department of Pathology for diagnosis by clinicians of the small animal clinic and from practitioners. Sixteen of the animals were autopsied and sections were examined histologically and in one instance a needle biopsy was performed. Permission for autopsy of the remaining 3 cases could not be obtained, but they are included because of a typical radiographic appearance of osteogenic sarcoma.*

Tissues were fixed in 10 per cent formalin and stained with hematoxylin-eosin. Bone containing tissue was decalcified in a 5 per cent nitric acid in 10 per cent formalin solution.

GROSS PATHOLOGY

This tumor appears characteristically as a localized swelling of the long bones near the junction of the shaft and epiphysis, the

*The x-ray diagnosis was done by Dr. A. E. Broome, M.D., F.C.C.P., Division of Radiology, Ontario Veterinary College, to whom grateful acknowledgement is made.

Fig. 1—Osteogenic sarcoma (178-53), involving the proximal third of the left humerus in a Pointer, after a biopsy was performed. Note how the scapular spine stands out because of the muscular atrophy.

Fig. 2—Tumor (1346-52) in the lower femoral shaft exhibiting an advanced tumor-osteogenesis of the posterior aspects of the femur. Radiographs of this bone showed the sclerosing type with a periosteal sun-ray effect, and invasion of the distal two-thirds of the medullary canal. Lung metastases were present.

so-called metaphysis. The swelling can become very large, and the overlying skin is usually intact, even in advanced cases. The leg often has subcutaneous and intramuscular edema, distally and proximally to the tumor, due to impaired circulation with venostasis and lymphostasis caused by the tumor infiltration. Advanced muscular atrophy of the affected leg, due to inactivity because of pain or to destruction of the motor nerves, and general emaciation are often present in neglected cases (fig. 1). Upon cutting the tumor, bone fragments are felt against the knife. The tumor tissue appears extremely vascular on the cut surface. Reddish hemorrhagic areas are scattered among firmer greyish portions. Characteristic are the yellowish irregular necrotic masses, many of which contain bone sequestra. Sectioning of the regional lymph nodes often reveals these to be enlarged and moist. This is due either to tumor invasion or to inflammatory reaction caused by the necrosis present in the primary tumor.

A rather high percentage of lung metastases is present in this material (table 2). Of the 16 autopsied cases, 7 had secondary metastases in the lungs, appearing as multiple, firm greyish nodules from the size of a pea to a chestnut. Upon cutting these nodules, osteoid tissue, showing varying degrees of calcification, was found in some cases.

HISTOPATHOLOGY

It is almost impossible to describe any histological picture as being characteristic of osteogenic sarcoma. The neoplastic osteoblasts can briefly be described as plump, spindle-shaped cells. They are situated in a loose fibrous or myxoid intercellular substance in which incomplete spicules of tumor bone are seen. The amount of bone formation and the number of giant cells are both subject to great variation. These features do not seem related to the clinical behavior of the tumor. Other characteristics, which are found to be more closely associated with the speed of growth, are the cellularity, the number of mitoses, and the degree of pleomorphism present. The multinucleated cells are of two types—the tumor giant cell and the osteoclast-like cell. The former type is the larger of the two; its cytoplasm stains only faintly with eosin

TABLE I—Cases of Canine Sarcoma Described in the Literature

Author	Age of dog	Sex	Breed	Site
McWhorter & Whipple[21]	7	M	Saint Bernard	D. radius
Hogard[9]	6	....	Newfoundland	D. femur
Joest (by Folger)[5]	2	....	....	D. forearm
Joest (by Folger)[5]	....	F	Hound	Temporal
Crocker[3]	....	....	....	Scapula
Crocker[3]	....	....	....	Femur
Stewart[19]	6	....	Great Dane	D. radius
Petit (by Feldman)[11]	....	....	Great Dane	Frontal
Petit (by Feldman)[14]	6	....	....	Forehead
Petit (by Feldman)[14]	....	....	....	D. femur
Petit (by Feldman)[11]	2	....	....	Rib
Leblanc (by Folger)[5]	6	F	....	P. femur
Bloom[2]	3½	M	Saint Bernard	D. radius
Bloom[2]	3½	M	English Bull	D. radius
Feldman & Ford[7]	2	M	English Setter	D. ulna
Rudduch & Willis[20]	6	....	Irish Setter	P. humerus
Rudduch & Willis[20]	10	....	Alsatian	Humerus
Rudduch & Willis[20]	10	....	"Cattle dog"	Humerus
Rudduch & Willis[20]	12	....	Fox Terrier	D. radius
Rudduch & Willis[20]	6	....	Saint Bernard	P. humerus
Rudduch & Willis[20]	10	....	....	Palate
Schnelle[15]	10	M	Russian Wolfhound	P. tibia fibula
Schnelle[15]	6	M	Collie	D. tibia
Schnelle[15]	Aged	....	....	D. tibia
Schnelle[15]	7	M	Boxer	D. tibia
Schnelle[15]	9	M	Collie	P. humerus
Schnelle[15]	7	....	Scottish Terrier	P. humerus
Schnelle[15]	6	....	German Shepherd	P. humerus
Schnelle[15]	9	....	Irish Wolfhound	D. radius
Schnelle[15]	Adult	....	Saint Bernard	Distal rad. ulna
Schnelle[15]	Adult	....	Mongrel	D. radius
Schnelle[15]	....	....	Shepherd	D. radius
Schnelle[15]	6	....	Pointer	Malar bones

D. = distal end; P. = proximal end.

Fig. 3—A case of an early osteogenic sarcoma (1056-52) of the osteolytic type, involving the distal end of the radius. The tumor has destroyed the cortex and invaded the medullary canal.

and the nuclei are large and vesicular, with only a small amount of chromatin (fig. 6). The osteoclasts are characteristically found close to the spicules of necrotic bone. They have small, dark nuclei situated in a relatively basophilic cytoplasm and resemble giant cells caused by foreign bodies.

Three different kinds of bone fragments can be demonstrated:

1) Bone, which is produced by the neoplastic osteoblasts, is a more or less unfinished product in which calcification has taken place only to a slight degree. This bone, being neoplastic, does not serve any useful purpose.

2) The formation of normal periosteal bone has been brought about by the irritation and expansion of the periosteum. The characteristic periosteal osteogenesis, which is named the reactive triangle, can be seen as bone cuffings in two radiographs

Fig. 4—A rapidly growing osteogenic sarcoma (178-53) of the proximal third of the humeral shaft. Note the thorough destruction of cortex and medulla and the reactive triangle of the periosteum. The intact proximal epiphysis seems to be demarcated from the tumor by the epiphyseal line.

Fig. 5—Osteogenic sarcoma (801-53) affecting the lower femoral shaft. In addition to the cortical and medullary destruction, a periosteal cuffing is seen on both anterior and posterior aspects of the femur. Lung metastases were present.

TABLE 2—Information on Cases of Canine Sarcoma Examined at the Ontario Veterinary College Over a Two-Year Period

File No.	Age	Sex	Breed	Site	Comments
1732-50	12	M	Boston Terrier	P. humerus	....
2182-50	4	F	Great Dane	Bone	Biopsy only
11-51	4	?	Great Dane	D. radius	Lung metastases
99-51	4½	M	Irish Setter	P. femur	....
801-51	8	F	Irish Setter	D. femur	Lung metastases
1031-51	Young	?	Spaniel	Rib	....
1044-51	12	F	Shepherd	Lumbar	....
1544-51	3	F	Bull Terrier	P. humerus	....
1553-51	4	F	Doberman Pinscher	D. radius	....
1645-51	6	M	Terrier	Femur	Lung metastases
29-52	5	M	Collie	Rib	Lung metastases
458-52	9	M	Collie	Pubic	Lung metastases
1056-52	10	?	Boxer	D. radius	....
1346-52	5½	M	Greyhound	D. femur	Lung metastases
1935-52	6	F	Saint Bernard	D. radius	....
2279-52	9	M	Great Dane	D. femur	Lung metastases
178-53	4	M	Pointer	P. humerus	....
1456	11	M	Greyhound	Mandible	Radiographic diagnosis only
52771	12	M	English Setter	P. femur	Radiographic diagnosis only
885	Aged	?	Cocker Spaniel	P. humerus	Radiographic diagnosis only

D. = distal end; P. = proximal end.

(fig. 4 and 5). This new bone serves to compensate for the deeper-lying, destroyed osseus tissue, and it tends to maintain the strength of the bone.

3) The remaining fragments of the destroyed cortex and cancellous bone are seen as spicules often surrounded by osteoclastic giant cells.

There is no basis for a histological classification because of the variation found in different cases and in different portions of the same case. In two instances, how-

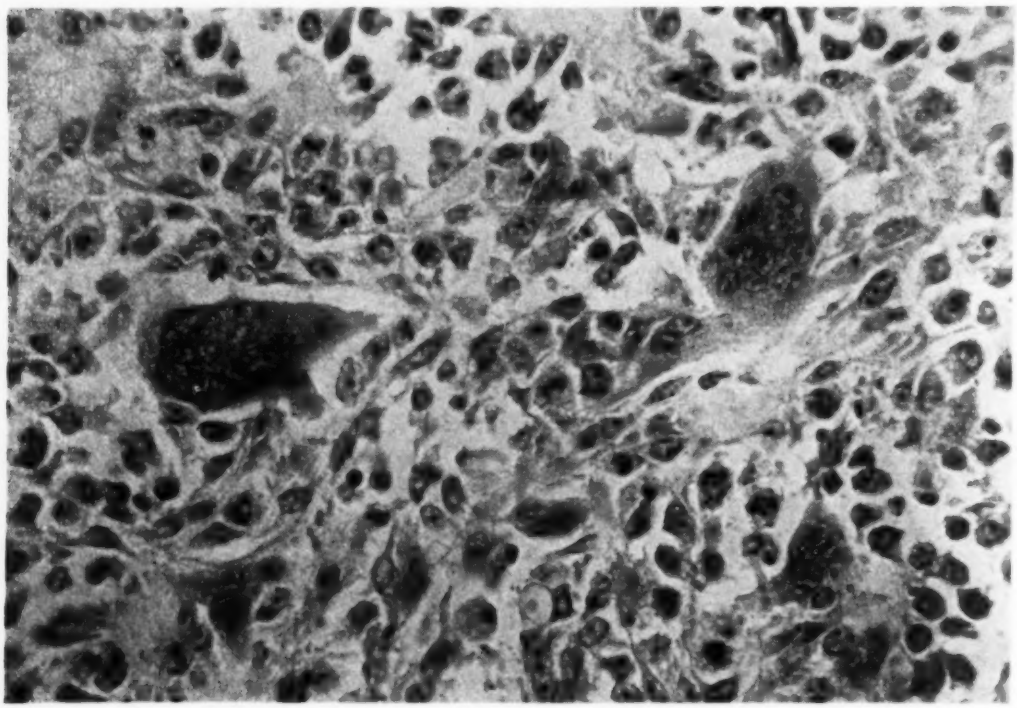

Fig. 6—Section from osteogenic sarcoma (1031-51) showing three tumor giant cells situated in a loose fibromyxoid stroma among pleomorphic osteoblasts. x 600.

ever, the microscopic appearance was somewhat similar to a fibrosarcoma (case 1056-52, fig. 3; case 178-53, fig. 4). Some cases exhibit only a few and very incomplete attempts to form bone, while others show extensive osteogenesis in both the primary and the secondary tumors (fig. 8).

DISCUSSION

The role of trauma as a predisposing factor to osteogenic sarcoma in the dog can not be properly assessed since a dog is rarely under observation continuously. Furthermore, it is often possible for an owner when being questioned to recall some sort of previous injury to the tumor-affected leg. The scientific value of such information is dubious, and no attempt has been made here to evaluate trauma as an etiological factor. Trauma, however, has been seen to cause a pathological fracture of a leg in which an osteogenic sarcoma has rarefied the bone.

TABLE 3—The Various Breeds Represented in the Literature and in the Material from the Ontario Veterinary College. Note the Few Cases Found in the Small Breeds

Breed	No.	Breed	No.
Great Dane	6	Pointer	2
Shepherd	5	Boxer	2
Setter	5	Bull Terrier	2
Saint Bernard	4	Fox Terrier	1
Collie	4	Scottish Terrier	1
Greyhound	2	Boston Terrier	1

This tumor, like its counterpart in man, affects predominantly the metaphyseal end of the shaft of the long bones. In man, 70 per cent of all osteogenic sarcomas occur in the lower limbs[2] which carry great weight and are constantly exposed to small trauma by running and jumping. In dogs, as in the horse, a greater weight is supported by the front legs than by the hind legs. This fact, together with the finding of a high incidence of osteogenic sarcomas in the heavy breeds (table 3), and more frequently in the front leg than in the hind leg (table 4), suggests that great weight and a continuous slight degree of trauma could be a predisposing factor of some significance. A characteristic difference in the age distribution of the tumors in man and in the dog seems to be present. In man, the osteogenic sarcoma commonly occurs at a relatively young age, while in the dog the large percentage of cases is found in middle-aged and old dogs (tables 1 and 2).

TABLE 4—This Illustrates the Location of the Total Number of Tumors Described in the Literature and at the Ontario Veterinary College

No. of dogs	Bone	Metaphysis
14	Radius	Distal
9	Humerus	Proximal
5	Femur	Distal
3	Femur	Proximal
3	Tibia	Distal

Fig. 7—Lung with three intravascular metastatic foci of highly cellular, non-bone-producing sarcomatous tissue (458). A bronchus with surrounding anthracotic pigmentation is seen in the lower portion of the picture. x 160.

The clinical differential diagnosis between osteogenic sarcoma and other bone lesions in the dog—osteomyelitis, in particular—can be very difficult. The anamnesis and the clinical and laboratory findings are, by establishing the presence of an infection, the most reliable diagnostic aids, while the radiographic examination alone can be deceiving. Other pathological entities affecting the long bones of the dog, which may be of interest from the view-

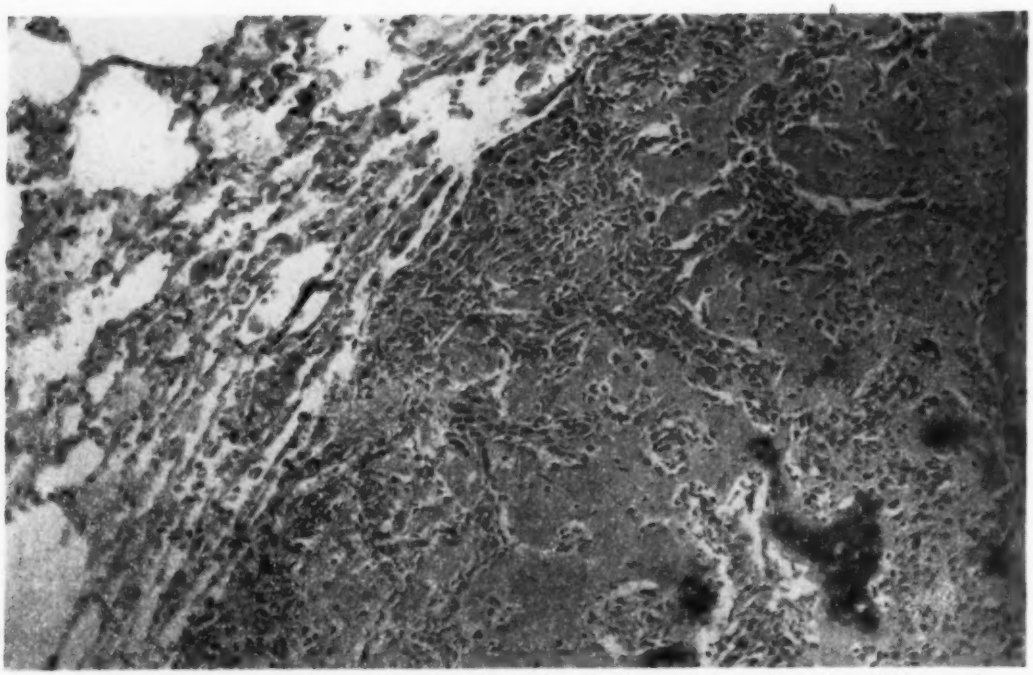

Fig. 8—Lung tissue containing a metastasis (801-51) with advanced bone formation. Evidence of calcification can be seen in the lower right corner. x 160.

point of differential diagnosis, are rarely encountered. One case each of giant cell tumor,[10] primary adamantinoma,[13] and Brodie's abscess[15] have recently been described in the veterinary literature.

SUMMARY AND CONCLUSION

In addition to the 33 cases of canine osteogenic sarcoma reported in the literature, 20 more cases are described in this paper. It is seen that this tumor most often affects dogs of the large breeds, and in particular the Great Dane. The smaller breeds, which are more commonly represented in the normal dog population, are rarely affected (table 3). The age incidence seems to be around 6 or 7 years. The sites predominantly involved are the ends of the shafts of the long bones, especially the distal metaphysis of the radius. The growth is characterized by a progressive bone destruction of the cortex and diffuse infiltration of the medulla and surrounding soft tissues. Pulmonary metastases are frequent complications (7 of 16 autopsied cases) which compares with the 20 to 50 per cent, five-year survival rate of osteogenic sarcoma in man. The histological appearance varies greatly and the radiographic picture can be very different from case to case, depending on which of the two properties—the osteolytic or the osteogenic—predominates. The treatment of choice is early amputation of the leg. If the tumor is diagnosed when it is well advanced, the chance for pulmonary metastases is so great that euthanasia should be advised. Radiographic examination of the lungs should be carried out in all cases.

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Effects of Western Equine Encephalomyelitis in Man

Drs. J. S. Fulton and A. N. Burton of Saskatoon, Sask., are the authors of an article (*Canad. M. A. J., 69,* 1953) on the after-effects of western equine encephalomyelitis (WEE) infection in man. A disease considered as a nonparalytic poliomyelitis appeared in Saskatchewan in 1935 and reached epidemic proportions by 1938. In 1939, the virus of western equine encephalomyelitis was isolated from two typical cases. Infants recovering from the acute condition often failed to develop mentally while older children frequently showed early mental deterioration. Some adults who had recovered from the virus infection developed mental illnesses a year or more later. This occurred in 15 of 101 cases which could be traced.

In 1950 and 1951, patients in two mental hospitals were tested. Prior to this test, a survey of 1,700 healthy individuals in the region had shown that all were negative to WEE except one, which gave a slightly suspicious reaction. All of the 1,500 patients in one of the hospitals, some of whom had been confined for thirty years, were tested. Some gave strong positive reactions six to twelve years after recovery from the original infection. Western equine encephalomyelitis had first been recognized in that region in 1936. All patients admitted prior to 1932 were negative. A partial reaction was shown by one patient admitted in 1933. Twelve with strong positive reactions and five with partial reactions had been admitted from 1937 through the first three months of 1951. Of the 619 patients received in the nineteen months since April 1, 15 (2.42%) were positive while three were suspicious. There had been no serious human encephalitis outbreak since 1947, but 12 of the 15 positives came from districts where that outbreak was severe.

In the second hospital, all patients who had been admitted prior to the appearance of WEE in the province were negative, while of the 189 patients admitted later, nine (4.76%) were positive, while one was suspicious. Of the nine positive, three had been admitted between 1942 and 1949 and six during 1950 and 1951. Not only do recognized cases of WEE tend to undergo mental deterioration but apparently a considerable number of cases which recover suffer mental breakdowns later.

How Detergents Prevent Bloat

Dr. R. E. Nichols, University of Wisconsin, explains that detergents prevent bloat by coalescing the small gas bubbles. This not only reduces the volume of the frothy mass but increases the specific gravity of the ruminal fluid so that roughage is more apt to stay afloat, thus allowing the water level to lower so that it will not cover the esophageal opening. When hay enters the rumen it remains afloat, grass sinks gradually, but fresh legumes sink rapidly. For preventive purposes, detergents must be found which are palatable and will not interfere with activities of the ruminal microorganisms.—*Feed Bag, Oct., 1953.*

A new vaccine and serum for acute hemorrhagic enterotoxemia of calves have been developed at the Colorado A. & M. experiment station. They are expected to be available in limited quantities in January, 1954.

A New Method for the Control of Swine Kidney Worms

JOSEPH E. ALICATA, Ph.D.

Honolulu, Hawaii

KIDNEY WORM (*Stephanurus dentatus*) infection represents one of the most important diseases in swine production. Kidney worms often cause emaciation and retard growth and are regarded as the principal cause of liver and kidney damage found in hogs at slaughter (fig. 1, 2, 3). The prevalence of this parasite in more than 50 per cent of the hogs slaughtered has been reported in many parts of the world, including some areas of the United States,[1] Australia,[2] the Philippines,[3] and the Hawaiian Islands.[4] This represents a considerable loss because, in most cases, the livers and kidneys of affected animals are considered unfit either for human consumption or for the production of biological products. The losses in the southern states (U.S.A.) from trimming of infected carcasses and condemnation of livers and kidneys have been estimated at about 2.7 million dollars annually.[5]

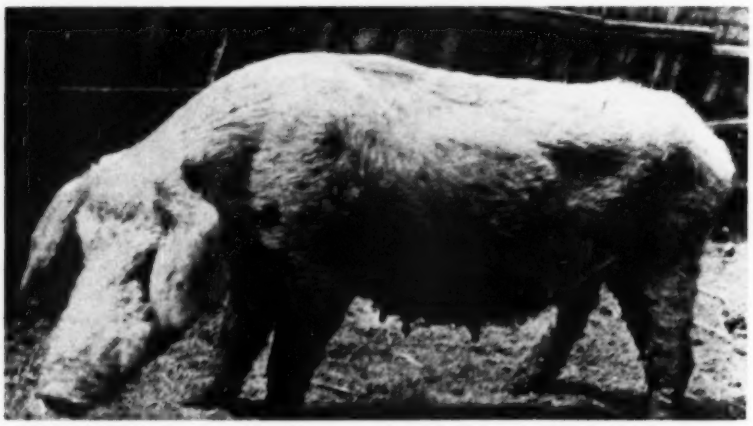

Fig. 1—Sow heavily infected with kidney worms.

HOW KIDNEY WORMS ARE SPREAD

The adult kidney worms, about 2 inches in length, are often found in or around the kidneys. They lay hundreds of eggs which pass out with the urine. In the presence of moisture on the ground, the eggs develop and hatch, and in about three to four days the newly hatched larvae reach the stage infective to pigs. Swine become infected by ingesting the larvae with contaminated feed or water, or by the larvae boring into the skin while the animal is lying on the wet, contaminated ground. After entering the body, the larvae migrate to various parts of the internal organs, especially the liver, where they remain and grow for several months. Eventually, these young parasites migrate to the kidneys where they mature and repeat the cycle. It is estimated that it takes about six months or longer from the time the parasites enter the body of the animal until they reach maturity and lay eggs.

NEW STUDIES IN KIDNEY WORM CONTROL

One of the major aspects in kidney worm control is preventing pigs from coming in contact with infective larvae which are found in the soil. Investigators[6] of the U. S. Bureau of Animal Industry have suggested the provision of a bare path around the pasture so that kidney worm eggs, deposited with the urine, would perish from exposure to sunlight.

More recently, the writer[7] has shown that "polybor-3" when used as a spray on the soil, at the rate of 5 lb. in 3 gallons of

Published with the approval of the director of the Hawaii Agricultural Experiment Station, University of Hawaii, as miscellaneous paper No. 50. Dr. Alicata is parasitologist and head of the Department of Parasitology of the experiment station.

The writer wishes to acknowledge the many valuable suggestions received from Mr. Harvey M. Vollrath, extension animal husbandman, University of Hawaii, in the preparation of this paper.

water to 100 sq. ft., destroys infective kidney worm larvae in about three weeks (fig. 4). Furthermore, for about four weeks after spraying, newly hatched larvae are killed before reaching the infective stage; however, during periods of heavy rainfall, the residual action of the spray may be reduced. The lethal action of polybor-3 on kidney worm larvae appears to be similar to that reported for various boron products on the dog hookworm larvae in soil.[8,9] Polybor-3 is a commercial product (Pacific Coast Borax Co.) composed of sodium pentaborate tetrahydrate and sodium tetraborate pentahydrate. This product, however, is injurious to plants and should not be used in areas where vegetation is to be maintained.

Since polybor-3 is a good larvicide and is relatively nontoxic,[7] it merits special consideration in kidney worm control. Observations on its value under field conditions, however, have been limited. Meanwhile, sanitation is paramount, so the following two plans of raising pigs for the control of kidney worms are suggested, one for sows and young pigs kept on concrete floors and one for those maintained on the ground:

PLAN A—FOR SOW AND LITTER KEPT ON CONCRETE FLOORS

1) Allow the sow to farrow on a disinfected concrete floor.

2) Wash the floor thoroughly each day. This is extremely important since hundreds of kidney worm eggs may be eliminated by the sow with the urine, and these eggs hatch and the larvae become infective in about three to four days. Do not allow the washings from the floor to enter the adjoining open lot referred to in chart 1, or to accumulate where they might be carried into this lot.

3) If the pigs are to be allowed outdoors, provide a small outlet for them, only, to an adjoining open lot which has not been used by older pigs for at least six months. If the lot is not used for crops, it may also be rendered free of kidney worm larvae by spraying it with polybor-3 at least four weeks before the young pigs are allowed access to it.

4) Provide separate and sanitary feeding and drinking pens for the sow and the young pigs.

5) After the pigs are weaned, transfer them to other concrete pens or to open lots.

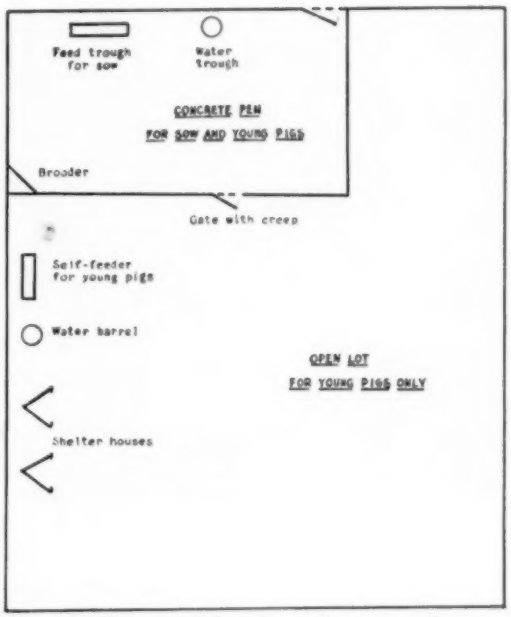

Chart 1—Plan A. Method for raising sow and young pigs on concrete floor and giving the young pigs access to a lot free of kidney worms.

These lots must not have been used by older pigs for at least six months, or must have been sprayed with polybor-3 at least four weeks previously.

6) Maintain all breeding animals in

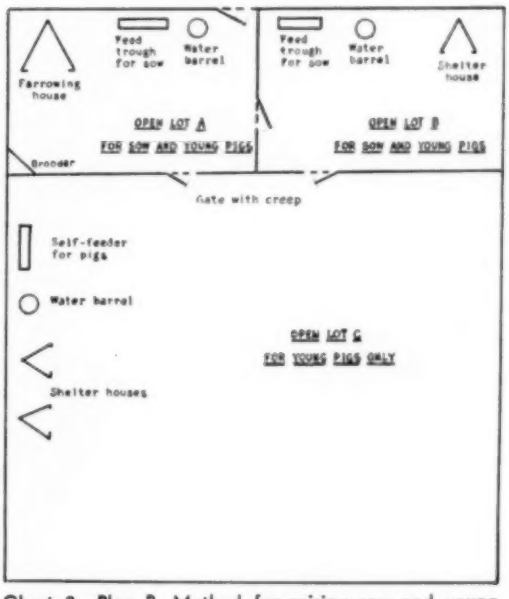

Chart 2—Plan B. Method for raising sow and young pigs on open lots and giving the young pigs access to a lot free of kidney worms.

Fig. 2—Adult kidney worms (natural size).

separate lots away from growing pigs. These lots should be sprayed as often as possible with polybor-3 for the purpose of keeping down further infection. Spray especially all areas which are kept shaded and damp. It is important to remove all trash before spraying. Even though polybor-3 is relatively nontoxic, animals should be kept away from the ground on the day of spraying as an added precaution.

PLAN B—FOR SOW AND LITTER KEPT ON THE GROUND

1) Fence off three adjoining lots (*a*), (*b*), and (*c*) as shown in chart 2. Lots (*a*) and (*b*), which need not be more than 25 feet wide, are to be used for the sow and the young pigs, and lot (*c*) for the young pigs alone. Provide a gate for transferring the sow from (*a*) to (*b*); furthermore, provide small outlets with gates to give the young pigs access to lot (*c*). If the terrain is sloping, lots (*a*) and (*b*) should be on the lower level.

2) If the above lots have been occupied by older pigs within a six-month period, spray them with polybor-3 at least four weeks before the sow is due to farrow. If lot (*c*) is used for crops, it naturally can not be sprayed; therefore, before allowing young pigs in, keep it free of older pigs for at least six months in order to allow any kidney worm larvae present to die out.

3) Spray lots (*a*) and (*b*) a few days before the sow farrows. Then place the sow in lot (*a*) and provide it with a clean farrowing house. (The application of the

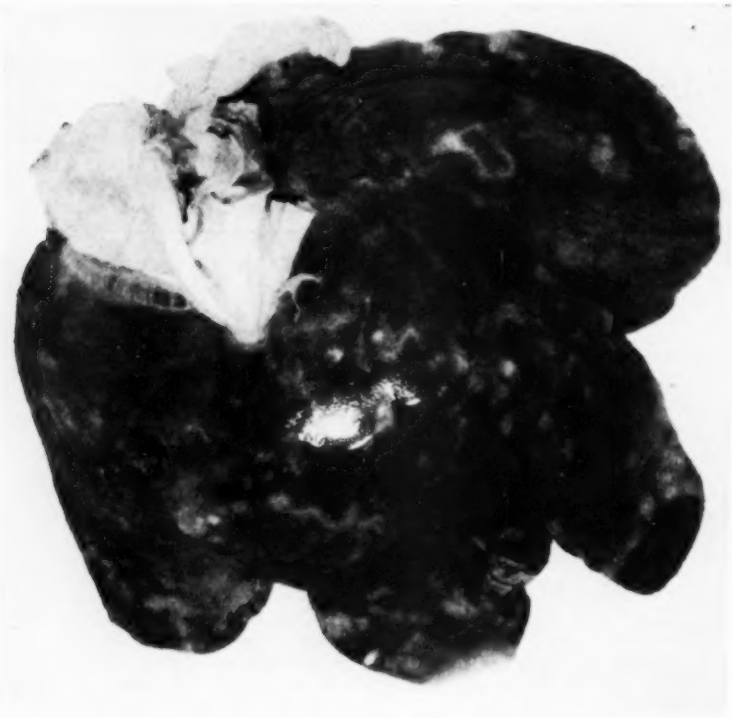

Fig. 3—Liver of swine showing lesions produced by the migratory, immature stages of the kidney worms.

Fig. 4—Livers of pigs slaughtered thirty days after the pigs were experimentally fed soil containing approximately 15,000 infective kidney worm larvae.

(Left) Liver of pig which was fed the infected soil twenty days after it had been treated with "polybor-3"; note normal color and absence of lesions.

(Right) Liver of pig which was fed the control untreated infected soil; note enlargement, discoloration, and extensive kidney worm lesions.

spray solution to the soil will prevent the growth of vegetation, thereby exposing the soil to sunlight and dryness; these factors also are important in the destruction of the parasite eggs and larvae.)

4) After the sow has farrowed, alternate the group between lots (*a*) and (*b*) every two to three weeks. Each time one lot is vacated, close all the gates and spray it with polybor-3; keep the lot empty until again occupied by the pigs.

5) Provide separate and sanitary feeding and drinking devices for the sow and the young pigs.

6) After the pigs are weaned, isolate them as outlined in items 5 and 6 of plan A.

In planning areas for the maintenance of hogs of all ages, it is advisable to choose lots which are sunny and well drained in order to control parasitic infections of all kinds. To avoid risk of heavy infections, it is desirable to change pastures every few years.

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Ascaris Lumbricoides, an Aberrant Parasite in a Lamb

Immature specimens of the swine white worm, *Ascaris lumbricoides,* occasionally are reported from lambs. Previous reports record 1 or a few specimens only, usually in the small intestine or bile duct. A 1932 report recorded a single *A. lumbricoides* in the abomasum of a lamb.

The present report records a relatively heavy Ascaris infection in a 2-month-old lamb received for postmortem examination from Marquette County, Wisconsin. The primary cause of death appeared to have been a severe suppurative nephritis. Approximately 20 specimens, the largest 64 mm. long, were recovered from the bile passages of the liver lobes proper; it was presumed that the worms had inhabited the bile duct proper previous to the death of the host. A few specimens were recovered from the rumen.—*A. C. Todd, Ph.D., University of Wisconsin, Madison; E. P. Pope, D.V.M., and B. Mendlowski, M.R.C.V.S., Wisconsin State Disease Control Laboratory, Madison.*

Paper No. N.S. 126, Department of Veterinary Science, University of Wisconsin. Published with the approval of the director of the Wisconsin Agriculture Experiment Station.

Liver Injury from Antibiotics

Chlortetracycline (aureomycin) and terramycin® occasionally cause mild liver injury in man when given parenterally. In one review, none of the 89 cases given chlortetracycline *per os* showed hepatic dysfunction but this was evident in 7 of 14 cases where oral therapy was supplemented with intravenous injections. Liver damage was confirmed by one biopsy and five necropsies.

In another 89 cases, where the drug was given postoperatively for prophylactic purposes, 30 developed hyperbilirubinemia in three to seven days, but returned to normal a few days after discontinuation of the drug. In an experimental series, when twenty persons each received 500 mg. of aureomycin intravenously twice daily for three consecutive days, nine developed transient hyperbilirubinemia. The risk of a damaged liver, therefore, must be weighed against the use of large intravenous doses of these antibiotics.—*Brit. M. J., April 4, 1953.*

Equine Encephalomyelitis in Utah

A Survey of Horses and Man Utilizing Serum-Neutralization Tests

A. W. GRUNDMANN, Ph.D., and G. R. LEYMASTER, M.D.

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WESTERN equine encephalomyelitis, and possibly other types of the encephalitides, have been frequently reported in Utah as producing disease among horses and occasionally in man. The actual etiological agent has been established through adequate laboratory methods only on rare occasions. This study was undertaken to provide information regarding the importance of human and equine infections with western equine encephalomyelitis (WEE) and St. Louis encephalomyelitis (SLE) in this area; chiefly to observe the frequency of immunity in the equine and human populations.

There have been few reported clinical cases in horses in the past ten years. Thus, the ratio of immune to nonimmune individuals would provide information that would be important relative to new outbreaks. This information, correlated with data regarding the individuals tested, would indicate to what extent the two viruses are being transmitted as inapparent or subclinical infections.

For these purposes, blood was collected from horses from various geographic areas of the state and examined by means of the serum-neutralization test for antibodies against WEE and SLE. Serum was also tested from a few human beings with no history of encephalitis, as well as some which was available from convalescent patients and others with acute encephalomyelitis. Since it is likely that the project of systematically surveying human, as well as equine, populations will not be completed, the data are published in less complete detail than is desired.

As far as could be determined from the literature and from conversations with local representatives of the Bureau of Animal Industry, the state veterinarian, and members of the Department of Veterinary Science at the Utah State Agricultural College, no previous studies of the frequency of infection with the neurotropic viruses had been made. With the exception of a few cases in horses,[1] no laboratory confirmation or virus isolation of the etiological agent involved in reported cases had been made. Suspected cases among horses have been diagnosed primarily on the basis of the clinical signs, which can not be considered a reliable method where there is the possibility of more than one encephalitic disease being present.

Encephalitis among horses has occurred in this area,[2,3] the last state-wide epizoötic being in 1938, with minor, localized outbreaks in 1939 and 1940.

MATERIALS AND METHODS

The western equine encephalomyelitis virus used in the serum-neutralization tests was a strain that was obtained from the Rockefeller Institute for Medical Research in 1949. It had an unknown number of mouse passages via the intracerebral route and was passed six times in mice in this laboratory prior to use. The stock virus was 10 per cent mouse brain, by weight, in 10 per cent normal, heat-inactivated rabbit serum and distilled water. The stock virus was stored at −25 C. in sealed pyrex tubes.

In preparing the virus for the tests, two separate pools of virus were used. These differed only in the number of mouse brain passages. Pool 1 was titered seven times; pool 2, three times. Both the Probit method[4] and the method of Reed and Muench[5] were used. The results of the titrations were reproducible within a narrow range. Pool 1, titered seven times in ten weeks, yielded a mean "50 per cent lethal dose" ($l.d._{50}$) of $10^{8.11 \pm 0.26}$ per 0.03 ml. The final calculation of the amount of virus used was based on the mean value of several titrations for each pool. For both the titration and the protection tests, serial dilutions of the virus were made in 10 per cent normal, heat-inactivated rabbit serum in heart infusion broth (Difco) at pH 7.4 and inoculated after two hours at 37 C.

The horse serums were collected from the jugular vein under aseptic conditions. The authors employed a highly successful technique, using the standard evacuated tube and double-pointed, 22-

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The authors express their gratitude to Dr. Wayne Binns, Utah State Agricultural College, Department of Veterinary Science, in the Logan area; to Dr. R. W. Gold in the Holladay area; and to members of the Bureau of Animal Industry field team in the Uinta Basin who aided in collecting serum.

gauge needle. The small gauge needle did not excite the animal when introduced into the vein if care was used in the process. By the use of this technique, sterile samples were obtained from horses, many of them unbroken and restrained only by a halter. After clotting, the serums were separated aseptically and stored at −25 C.

Both the human and equine serums were collected from various parts of the state in an effort to establish distribution of the diseases. Horses were selected from farms and ranches on the basis of convenience, usually only 2 or 3 at each farm or ranch. Colts under 1 year of age were not tested. Age, previous vaccination, and clinical data relating to encephalitis were recorded for the animals tested.

TABLE 1—Occurrence of Protective Antibodies in Horse Serum Against WEE

Origin of specimen (Utah)	Horses tested (No.)	Positive (No.)	Positive (%)	Horses under 9 years of age tested (No.)	Horses under 9 years of age pos. (No.)	Horses 9 years of age and over tested (No.)	Horses 9 years of age and over pos. (No.)
Northern	15	6	40.0	9	2	6	4
Northeastern	10	4	40.0	6	0	4	4
Central	14	9	64.3	7	7	7	2
South-central	37	17	45.9	22	8	15	10
South-western	27	11	40.7	17	7	10	4
Total	103	47	45.6%	61	24	42	24
				39.3 positive		57.1% positive	

Protection tests were performed by mixing undiluted, sterile horse serum with an equal amount of virus of the desired dilution and allowing it to stand, with occasional shaking, at 37 C. for two hours. The horse serums were not inactivated by heat. Albino Swiss mice, 3 to 4 weeks of age, were used, with 6 to 8 mice per test. Each mouse received 0.03 ml. of the inoculum intracerebrally and was observed for ten days. Controls were inoculated with virus only. Deaths occurring within twenty-four hours were considered nonspecific. When 50 per cent or more of the mice survived the ten-day period and all control animals died, the serum was considered to have protective antibodies. This test, when positive, was used as presumptive evidence of protective antibody in the horse and, by inference, to indicate past infection of the animal.

An effort was made to use between 50 and 100 $l.d._{50}$ for protection tests for both WEE and SLE viruses. This was fairly successful with the former, since the calculated doses used ranged from 22 to 316 $l.d._{50}$. Fifty-three serums were tested with an estimated 63 $l.d._{50}$ of virus.

The SLE virus, the Webster No. 3 strain, was obtained from the Army Medical Center. For this virus, the calculated dose ranged from 100 to 1,000 $l.d._{50}$. Four titrations were performed on this virus pool with a mean titer ($l.d._{50}$) of $10^{3.3 \pm 0.05}$ per 0.03 ml. Because of the smaller number of titrations and the larger dose of virus used, the neutralization tests with this virus were not considered comparable in accuracy to the preceding tests with WEE and were less sensitive as an indicator of past exposure to the virus.

RESULTS

During the study, the serum of 103 horses and 45 human beings was tested against WEE virus by the serum-neutralization method. Of the horses, 47 (45.6%) showed positive protection. Antibodies were demonstrated in serum from each of the localities sampled, although the proportion of positive animals varied widely. The samples are regarded as being statistically too small to indicate accurately the degree of immunity of the horse population, but do indicate widespread distribution of the disease in the state. Data regarding geographical distribution are shown in table 1.

Also of interest was the age of the horses in relation to immunity. They were divided into two groups, those born after 1940 and those born during or before 1940. Of the former group, raised since the last important outbreak of the disease, 39.3 per cent demonstrated antibodies, as compared with 57.1 per cent of the older group; a difference which is of doubtful statistical significance ($p=0.08$).

More significant is the high proportion of immune animals born since the last major outbreak, indicating that the disease apparently is being transmitted to a degree far exceeding the frequency of recognized infection.

The serums of 53 horses were tested against the virus of St. Louis encephalomyelitis with 6 showing an immune titer and 6 a doubtful reaction. Had a lower $l.d._{50}$ of the virus been used, the latter 6 animals probably would have demonstrated a protective level of antibody. Antibodies were demonstrated in serums from all localities tested.

The human serums were tested against western equine encephalomyelitis. Of the 15 clinical cases of encephalitis of unknown etiology, one proved to have developed neutralizing antibodies. Tests of 30 "normal" individuals with no history of encephalitis showed 2 to have a protective level of antibodies.

DISCUSSION

The data regarding the observed occurrence of neutralizing antibodies against WEE in horses has several implications.

The last outbreak of clinical encephalo-

myelitis in horses occurred in 1940. The occurrence of a high proportion of neutralizing antibodies in horses born since that time indicates that the disease has continued to occur in horses, but apparently in subclinical or inapparent form. At none of the farms where blood samples were obtained had clinical equine encephalomyelitis been recognized since 1940.

The fact that positive tests had been obtained in samples from all parts of the state indicates that the infection is widespread and not limited to local areas.

It is not possible to determine the exact level of neutralizing antibody which indicates immunity. Arbitrarily, a dose of 50 to 100 $l.d._{50}$ was selected with the belief that this was a strenuous test when performed in mice by the intracerebral route and that false positive results would be infrequent. Most surveys of man and animals have been done with virus doses of this level; however, techniques of testing vary so much as to make strict comparisons impossible. The possibility that there may be nonspecific substances in horse serum which will neutralize WEE and SLE virus can not be excluded.

SUMMARY

Of 103 horses from various parts of Utah tested for western equine encephalomyelitis, 45.6 per cent showed neutralizing antibodies.

Antibodies were demonstrated in 59.1 per cent of the 42 horses born during or prior to the last encephalomyelitis epizoötic (1940), and in 39.3 per cent of the 61 born later.

When 53 of these horses were tested for St. Louis encephalitis antibodies, 6 were positive and 6 were doubtful.

Of 15 persons with a clinical history of encephalitis whose serums were tested for antibodies, 1 was positive. Serums of 2 of 30 persons with no history of encephalitis were positive.

The epidemiological significance of these findings is discussed.

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Cattle Grub Control

Cattle grubs were not reduced in a herd of 2,500 grade Hereford cattle in New Mexico when sprayed only once, annually, during the height of the annual grub season for three consecutive years (1946 to 1948). The high-pressure spray was applied to the backs of the cattle while they were confined in the type of chutes or crowding pens usually found on western ranches. Because this did not permit uniform close-up spraying of all the animals, it resulted in a variable and unsatisfactory grub kill.

Improved methods consisting of narrow, portable knock-down chutes, and two sprayings per grub season for two consecutive years (1949 and 1950), reduced the total grub population to only 17 per cent of what it had been two years earlier. Only 29 per cent of the cattle harbored grubs, whereas 80 per cent were infested two years earlier. Well-planned and properly conducted spraying programs can materially reduce, but probably not entirely eliminate, the grub population in ranch cattle. —*The Cattleman, Oct., 1953.*

Danger in Use of Muscle Relaxants

The Council on Pharmacy of the American Medical Association has authorized the recommendation that muscle relaxants, potent agents not devoid of danger, should not be used routinely or indiscriminately except when an important advantage can be gained. When first introduced, they were expected to lower operative mortality by requiring either a lower level of anesthesia or more effective work at the usual levels. However, the margin of safety between the necessary dose and the paralyzing dose is small. They should not be used without having at hand facilities for combating respiratory and circulatory collapse, the latter never being easy and sometimes impossible.—*J. Am. M. A., Oct. 31, 1953.*

Tuberculosis in young pigs is more readily induced, experimentally, in those born to tuberculous sows.—*Vet. Rec., Oct. 3, 1953.*

Salmonella Bredeney Infection of Calves and Prophylaxis with Chloromycetin and Streptomycin

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WITH NEWER methods in dairy management and the trend toward specialization, most large dairies do not attempt to raise calves. Replacements are purchased for immediate introduction into the milking string and most calves are sold. It is a common practice among farmers and calf raisers to buy the heifer calves from livestock sales or dealers and raise them with nurse cows or by bucket feeding.

This movement of weak and debilitated animals into pens and vehicles contaminated previously by sick animals has led to a widespread dispersal of calf diseases, especially those of the scours complex. Large shipments of calves move from the milksheds to areas where market milk is not the primary consideration. These calves arrive at their destination when they are 3 to 5 days of age, with an uncertain history of colostrum consumption. Soon after arrival, scours of nutritional or infectious nature develop and often high mortality is encountered.

This paper is concerned with the isolation of *Salmonella bredeney* from calves with this history, its relation to the calf scours complex, and the use of chloromycetin® * and streptomycin as prophylactic agents in salmonellosis.

LITERATURE

Salmonella dublin is recognized in many parts of the world as the Salmonella type adapted to cattle and causing severe losses in young calves. Bosworth and Lovell,[1] Craig *et al.*,[2] and Field[3-5] have reported outbreaks of *S. dublin* infection in calves. The low incidence of *S. dublin* in cattle in the United States is in distinct contrast to its incidence in most parts of the world.

According to Kauffmann,[6] the first two strains of *S. bredeney* described by him were isolated by Hohn and Herrmann from man. One of these was isolated from feces from a person having diarrhea. The second came from pus from a case of osteomyelitis of the femur. Edwards[7] included *S. bredeney* in a checklist of Salmonella from fowl. Pomeroy and Fenstermacher[8] isolated the organism from turkeys. Cunningham[9] has reported *S. bredeney* from young quail; Beaudette[10] from guinea fowl; and Hinshaw and McNeil[11] from Chukar partridges, turkeys, and ducks.

Reports of salmonellosis in cattle due to *S. bredeney* are infrequent. Bruner and Moran[12] cite but one outbreak in cattle, while in swine they report 143 outbreaks.

Rogers *et al.*[13] and Clement *et al.*,[14] report successful use of chloromycetin in gastroenteritis of infants due to various microörganisms. Ross *et al.*,[15] Smadel,[16] and Rosove *et al.*[17] are of the opinion that it is the drug of choice in salmonellosis. Clinical trials with chloromycetin against several animal diseases have demonstrated the effectiveness of this antibiotic in a wide variety of infections. Eastman *et al.*,[18] in limited trials, obtained a favorable response with chloromycetin in several cases of infectious diarrhea of calves.

MATERIALS AND METHODS

The calves involved in this study were housed in individual pens, 4 ft. by 8 ft., inside a large barn. The pens were cleaned daily and straw was used for bedding. The ration consisted of reconstituted dried milk solids plus fat, vitamins, and minerals. This simulated milk was 14.5 per cent solids and was fed on the basis of 1 lb. of fluid per 10 lb. of calf weight daily. Commercial calf pellets and good quality hay were present at all times. All calves were cared for by a single caretaker and maintained in a similar manner except for the antibiotic used as a disease preventive.

EXPERIMENTAL

Thirty-seven calves obtained from several dairies in the Los Angeles area were assembled and held for twenty-four hours by a calf dealer. The animals were then hauled 400 miles in a closed truck during a severe rainstorm. On arrival, all calves were examined clinically and fecal samples were obtained for bacteriological examination. The results of these examinations are presented in tables 1 and 2.

Group A (table 1) consisted of 22 calves approximately 5 days of age. Five calves (23%) showed signs of weakness, 7 (32%) had diarrhea, and cultures showed that 76 per cent were shedding Salmonella organisms in their feces.

After examination, group A was immediately started on a regimen of streptomycin therapy in an effort to forestall infectious scours. On this first day of treatment, each calf was given 500 mg. of streptomycin intramuscularly and 500 mg. orally,

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*Trade-name for chloramphenicol, produced by Parke, Davis and Company, Detroit, Mich.

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followed by 750 mg. orally for the next three days. The results of this therapy are shown in table 1. Four animals were dead and 11 were scouring at the end of the treatment period and 6 more died subsequently, making a total of 10 deaths (45% mortality) in the streptomycin-treated group A.

Group B (table 2) consisted of 15 calves approximately 5 days of age. Six calves (40%) showed signs of weakness, 8 (56%) had diarrhea, and 66 per cent were shedding Salmonella organisms in their feces.

After examination, group B was immediately started on a regimen of chloromycetin therapy. Each calf received 500 mg. of the drug orally for four days. The results of chloromycetin therapy are shown in table 2. At the end of four days of treatment, only 2 calves were scouring, and 1 died three days later. The mortality was 7 per cent in the chloromycetin-treated group B in comparison to the 45 per cent mortality in the streptomycin-treated group A.

SYMPTOMATOLOGY

In a majority of the animals that died, the symptoms of septicemia were predominant, while diarrhea was a minor sign. These calves developed temperatures of 105 to 107 F. and died twenty-four to forty-eight hours after appearing sick. In other cases, apparently healthy calves showed feces of normal consistency mixed with mucous plugs containing blood. If untreated, a large percentage of the calves developed what may be called the "scours complex." The early stages were characterized by dullness, loss of appetite, rough coat, high fever, and rapid pulse and respiration. The feces were fluid and offensive. The occurrence of blood in the fluid feces was variable.

NECROPSY FINDINGS

Abomasal or intestinal lesions of variable extent and severity were present in all of the calves at necropsy. In 4 calves, the abomasum appeared normal; in a fifth, there was only slight reddening of the fundus mucosa; but in the other 6, there appeared marked diffuse reddening of most of the lining. Several of this latter group showed grayish, friable areas of necrosis on the folds of the fundus, varying from a few foci 1 cm. in diameter to large, confluent patches involving most of the fundus. There were mucosal hemorrhages and occasionally free blood in the abomasal contents. Microscopically, the necrotic areas showed hyperemia, hemorrhage, a heavy mixed leukocyte infiltration and necrosis which extended deeply into the mucosa. Branching, septate mycotic hyphae were found penetrating the dead tissue and involving the normal tissue.

The intestinal lesions varied from patchy redness to diffuse intense redness of much of the canal. The ileum and cecum were most severely affected. Blood-stained contents were seen in some animals.

Mesenteric lymph nodes were normal or appeared reddened and sometimes enlarged. The liver showed normal gross and micro-

TABLE 1—Condition of Calves on Arrival at 5 Days of Age, and Results of Streptomycin Treatment (Group A)

Calf (No.)	Condition on arrival		Character of feces during treatment					Mortality	
	Salmonella in feces	Strength of calf	1st day	2nd day	3rd day	4th day	End of treatment	Age at death	Salmonella in spleen
50	+	W	2	2	1	2	2	22	+
51	+	S	0	0	0	1	*	9	....
52	+	S	0	0	0	1	1	....	....
53	+	S	0	0	2	2	2	21	+
54	+	W	2	2	..	..	*	7	No C
55	+	W	3	3	1	..	*	8	No C
56	+	W	1	0	2	2	2	10	No C
57	+	S	0	0	0	0	0	....	....
58	+	S	0	3	2	2	2	....	....
59	+	S	0	0	1	2	2	....	....
60	+	S	0	0	1	0	0	....	....
61	—	S	0	1	0	0	0	....	....
62	+	S	0	2	1	3	2	11	+
63	—	S	0	0	0	0	0	....	....
64	+	S	0	0	3	2	2	....	+
65	—	S	0	1	3	2	2	11	....
66	+	S	2	0	1	0	0	....	....
67	—	S	2	1	0	0	0	....	....
68	+	W	3	2	3	2	2	10	+
69	—	S	0	0	1	..	*	8	+
70	+	S	0	0	0	0	0	....	....
71	+	S	0	2	3	2	2	....	....

0 = Normal well-formed fecal passage; 1 = normal consistency with mucous and blood; 2 = fluid consistency; 3 = fluid consistency with blood; S = strong and vigorous; W = weak and depressed; * = dead before end of treatment; No C = not cultured.

scopic appearance for calves of this age, with none of the tiny foci often reported in salmonellosis. The spleen was normal. Some congestion was found in the kidneys. Epicardial petechiae were observed in several calves. The lungs were quite hyperemic and showed some alveolar edema. All of the carcasses showed dehydration.

BACTERIOLOGY

It was felt that this problem might offer an opportunity to compare different isolation techniques for Salmonella and for this reason two methods were used. The work of Galton and Quan[19] was reviewed and similar procedures followed. Both tetrathionate broth (formulas of Kauffmann) and selenite F were used as enrichment mediums. SS agar and brilliant green agar were compared as primary plating mediums. However, the number of Salmonella organisms in the feces was evidently so great that there appeared to be no significant difference between the two isolation techniques; both methods proving equally efficient in isolating *S. bredeney*. For positive identification, the cultures were sent to the California State Department of Public Health in Berkeley and *S. bredeney* was identified in every instance.

DISCUSSION

When young calves are assembled from many sources and placed in pens previously used to house sick calves, it readily results in the rapid spread of infectious organisms, especially enteric ones such as Salmonella. Add to this the aggravation of long trips in crowded trucks, and the arrival of calves with definite signs of disease or in the late incubation stages can be predicted.

Of the 37 calves used in these experiments, 73 per cent were shedding *Salmonella bredeney* in their feces before treatment. They were also showing signs of weakness and various degrees of diarrhea. They were sorted so as to distribute the sick ones equally for the two treatments to be used. In the streptomycin-treated group A, 10 calves died. The spleens of 7 of these were cultured and in 6 instances *S. bredeney* was isolated in pure culture. In the chloromycetin-treated group B, only 1 calf died and it also yielded a culture of *S. bredeney* from the spleen. The presence of the organism in the spleen leaves little doubt as to its role in this obviously septicemic disease. In cases where the course of the disease was longer, areas of mucosal necrosis and hemorrhage into the abomasum were common. These lesions may be due to the combined effects of Salmonella and a complicating fungous infection.

It is probable that, whenever adequate bacteriological search is made, Salmonella species might be found to be implicated in the calf scours complex. Little evidence has been presented to refute the early studies of Meyer *et al.*[20] who were able to demonstrate the high virulence of Salmonella organisms for experimental calves.

The rapid cessation of symptoms and mortality following chloromycetin® therapy would indicate the feasibility of routine prophylaxis in calves that are carriers of, or exposed to, Salmonella infection. In animals not responding to oral administration of 500 mg. of chloromycetin daily, the dosage should be increased to 1.0 or 1.5 Gm. daily. In stubborn cases of the disease, the intravenous form of the drug is indi-

TABLE 2—Condition of Calves on Arrival at 5 Days of Age, and Results of Chloromycetin Treatment (Group B)

Calf (No.)	Condition on arrival		Character of feces during treatment					Mortality	
	Salmonella in feces	Strength of calf	1st day	2nd day	3rd day	4th day	End of treatment	Age at death	Salmonella in spleen
35	+	S	0	0	0	0	0	....	....
36	+	S	0	0	0	1	0	....	....
37	+	W	2	2	2	1	0	....	....
38	−	W	3	1	1	1	2	12	+
39	+	S	0	0	0	0	0	....	....
40	+	S	0	0	0	0	0	....	....
41	+	S	0	0	0	0	0	....	....
42	−	W	2	2	2	1	0	....	....
43	+	S	0	0	0	0	0	....	....
44	−	W	3	3	1	0	0	....	....
45	+	S	0	0	0	2	2	....	....
46	−	S	2	2	0	0	0	....	....
47	+	W	1	2	1	1	0	....	....
48	−	W	3	1	1	0	0	....	....
49	+	S	2	3	1	0	0	....	....

0 = Normal well-formed fecal passage; 1 = normal consistency with mucous and blood; 2 = fluid consistency; 3 = fluid consistency with blood; S = strong and vigorous; W = weak and depressed.

cated, especially when septicemia is evident. It should be understood that the use of drugs is not a substitute for correct management practices. Poor sanitation and nutritionally inadequate rations predispose calves to many infections.

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Studies of Scrapie in Sheep

Scrapie is a neurosis characterized by intense progressive pruritus and locomotor incoördination. Attempts, from 1869 to 1937, to reproduce the disease by inoculation or immediate contact failed. In 1932, without direct contact, 3 or 4 sheep with scrapie were alternately pastured on the same lot with 26 healthy ewes. Not until thirty-nine months later did 1 ewe show symptoms, but in the next two years 10 developed scrapie. Before their illness appeared 8 wethers, born April 1, 1934, from these ewes, were accidentally included in a group from which a batch of louping ill tissue vaccine was made in 1935.

The vaccine was prepared from brain and other tissues, of inoculated sheep, preserved in 0.35 per cent formalin solution. In 1937, scrapie developed in several flocks which had, in 1935, been given this vaccine subcutaneously. Thus, it was accidentally learned that: (1) scrapie virus is present in the brain long before symptoms appear; (2) it can remain infective in a formalin solution at least three months; (3) it can be transmitted by subcutaneous inoculation; and (4) the incubation period may be twenty months or longer.

In other experiments, 5 of 8 sheep after inoculation developed scrapie as follows: 2, fourteen and twenty-two months after intraocular inoculation; 1, nineteen months after subcutaneous inoculation; 1 a year after epidural inoculation; and 1, eleven months after intracerebral inoculation. Vacuolation of nerve cells of the medulla was found in all of these cases.—*J. Comp. Path. & Therap., 1950.*

1952 Tuberculosis Morbidity

In 1952, 109,837 new tuberculosis cases in man were reported in the continental United States, a decline of 7 per cent from 1951. The highest number per 100,000 population was in Arizona with 164; the District of Columbia, 145; and New Mexico, 93. The lowest number of cases per 100,000 population were reported in Nebraska, with 16; Wyoming, 18; Iowa, 19; and Utah, 20. Alaska had 408 cases, Puerto Rico 246, and Hawaii 67 cases per 100,000.—*Pub. Health Rep., Nov., 1953.*

A New Laboratory and Field Diagnostic Test for Fluke OVA in Feces

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THE DIAGNOSIS of liver fluke infection in cattle and other animals can effectively be accomplished by sedimentation techniques for concentration of fluke ova in the fecal material, and subsequent examination of this sediment with the aid of a stereoscopic (dissecting) microscope. A low power microscope may also be used; however, this involves examining small fractions of the sediment until the total quantity has been observed. Enzoötic fluke-infected areas may be located through packing house reports on slaughtered cattle or through actual necropsy of animals sick or dying from this disease. Liver fluke infection in individual animals or herds, however, is usually diagnosed by microscopic examination of fecal material for fluke ova. These fluke ova are characteristic in size, shape, and color, making identification relatively easy. The operculated shell of fluke ova prevents the use of high specific gravity flotation techniques, as the ova distort in these solutions. In microscopic examination of feces for fluke ova, it is necessary to separate the fecal particles and colloidal coloring materials from the ova to give a clear, well-defined, easily read sample, insuring an accurate diagnosis.

REVIEW OF LITERATURE

Swanson and Hopper[1] have reviewed the literature on liver fluke diagnosis, and it is not necessary to repeat these pertinent facts relative to previous liver fluke examination procedures in this paper. The Swanson-Hopper[1] method uses large volumes of water, washing the material through 20-, 40- and 60-mesh screens, and involves several transfers of fecal material. To obtain a per-gram count on a given sample, it is necessary to make four separate readings. They were the first to stain the eggs with iodine, using a 15 per cent solution of tincture of iodine which aids in detecting and counting the fluke ova.

Rivera-Anaya and Martinez de Jesus[2] have reported on an improved technique for the microscopic diagnosis of liver fluke infection in cattle. They modified the Swanson-Hopper[1] method by using 1 cc. of a 1 per cent solution of aluminum sulfate to 1,000 cc. of fecal suspension to hasten the sedimentation rate. They also used standard tincture of iodine to stain the ova. This modifica-

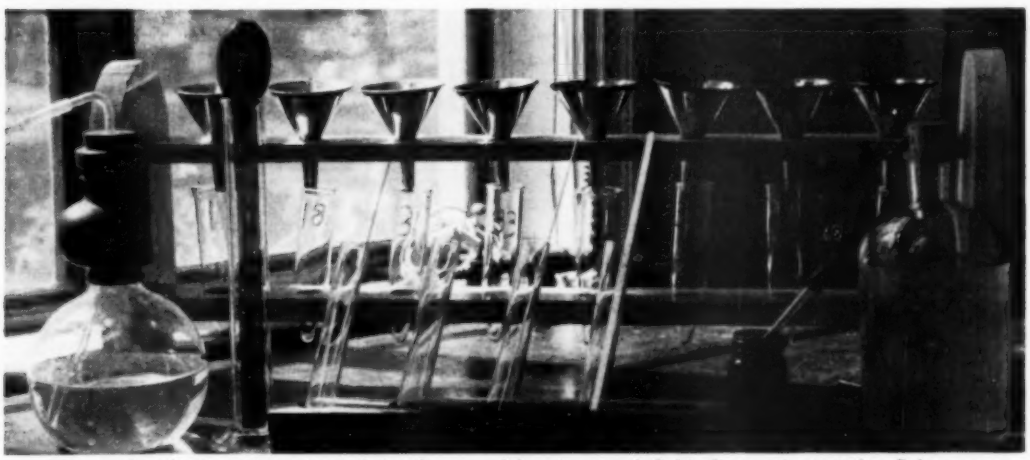

Fig. 1—Standard equipment used in the new laboratory and field diagnostic test for fluke ova in feces.

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tion is still time-consuming and, although accurate, involves several transfers of fecal material, which increases the chance loss of fluke ova.

In the two methods cited above, many of the ova were observed floating on top of the water, resulting in inaccurate counts. A centrifuge and transferred to the counting dish gives a clear, well-defined field for microscopic examination.

The majority of the fecal samples used in the development of this technique were obtained from cattle. However, goats and sheep were included in the testing of this technique. These fecal sam-

Fig. 2—Rack of centrifuge tubes showing siphoning technique. Tubes 4 and 8 show staining of debris.

5-Gm. samples of fecal material were used for examination; whereas in this new method the centrifuge is unnecessary and only a 1-Gm. sample is used. Willmott and Pester[3] reported on variations in fecal egg counts for Paramphistomum (rumen fluke) infections (a fluke ovum similar to *Fasciola hepatica)* as determined by their technique. In the opinion of the authors, these writers have elaborated on the type of equipment used in fluke ova counts, thus making the operation more laborious and utilizing specialized equipment.

An improved laboratory technique for fecal examination for fluke ova has been developed which shortens time, improves accuracy, requires less equipment, and is adaptable to field conditions. It is reported in this paper to assist veterinarians and research workers in their diagnostic and experimental procedures.

MATERIALS AND METHODS

During the past year, a new technique has been developed for fluke ova examinations in fecal materials that has speeded up microscopic diagnostic work in the field as well as in the laboratory. It consists of the use of a detergent solution to free the colloidal matter and fecal material from the fluke ova. Detergent solutions penetrate fecal material more readily than water and, in addition, suspend the colloidal coloring matter in solution, allowing the ova to fall rapidly to the bottom of the centrifuge tube. The sediment left in the bottom of the tube is of small quantity and when

ples were sent in routinely by practitioners, cattlemen, and county agents from representative areas of Florida. In all cases, the samples were taken directly from the animal's rectum and marked for positive identification of the animal, chilled overnight, and shipped direct to this laboratory for examination. In these parasite examinations, the procedure as outlined by Swanson and Hopper[1] was used for comparison on time and accuracy.

After using 25 detergents, of which 18 were non-ionic types, the liquid detergent "joy"* has proved to be highly satisfactory in this work. However, "glim,"** a similar liquid detergent, under limited experimentation, has also proved efficient. The choice of joy and glim over other detergents tested is that they place the fecal material in solution more readily, clean the ova from fecal debris and colloidal material, thus allowing the maximum number of ova to be carried in suspension through the fecal material and filter screen. The supernatant fluid is then siphoned off and discarded, leaving a small amount of fecal debris and ova which stain reliably with tincture of iodine.

The materials and equipment used are (fig. 1):

1) Detergent solution (joy or glim), 5 cc. added to 995 cc. of tap water, to which is added 8 drops of a 1 per cent solution of alum (aluminum potassium sulfate, U.S.P.).

* Produced by Proctor and Gamble Manufacturing Co., Chicago.

**Produced by B. T. Babbit and Co., Chicago.

2) A tin funnel, 3½-inch diameter, with 80-mesh copper screen soldered 1 inch from the top of the funnel.
3) Large test tubes and stirring rods.
4) Centrifuge tubes, 50-cc., placed in suitable rack.
5) Standard tincture of iodine.
6) Wash bottle or other suitable container.
7) Scribed flat-bottom molded culture dish or Petri dish.
8) Wide-field stereoscopic (dissecting) microscope or low power microscope (18 x or higher). (Not shown in fig. 1.)

Fig. 3—Fluke ova and debris as seen at 18 x through a stereoscopic microscope. Note 16 fluke ova well defined in a clear, easily read field.

PROCEDURE

1) Collect from the rectum a 300- to 500-Gm. fecal sample, mix thoroughly and, if very dry, add water to bring consistency to a workable mix.

2) Take a 1-Gm. sample of feces, place in a large test tube, add 15 cc. of the detergent solution; mix well with a stirring rod. *Caution:* Do not shake as too many suds will form.

3) Strain the sample through a funnel with an 80-mesh screen filter into a 50-cc. centrifuge tube. Rinse the original test tube with more detergent solution to loosen any fluke ova and debris adhering to the test tube. Continue to pour more detergent solution in a flooding, swirling motion through the fecal material in the funnel to finish filling the 50-cc. centrifuge tube.

4) Allow the solution to stand in the centrifuge tube a minimum of five minutes and not over fifteen minutes, as too much debris will collect at the bottom of the tube after this maximum period. Siphon off three-fourths of the liquid portion.

5) Rewash the fecal material in the filter funnel with more detergent solution in a flooding, swirling motion sufficient to refill the 50-cc. centrifuge tube and to recover any ova trapped at the first washing. Discard washed fecal matter left in the funnel.

6) Again allow solution to stand in the centrifuge tube a minimum of five minutes or a maximum of fifteen minutes. Siphon off all liquid down to about 2 to 3 cc., being careful not to disturb the sediment in the bottom of the tube (*see* fig. 2).

7) Add 1 to 3 drops of standard tincture of iodine to the sediment in the centrifuge tube. Let it stand two to five minutes. The number of drops of iodine depend upon the

Fig. 4—Fluke ova and debris as seen at 50 x through a regular microscope.

amount of sediment present in the sample (fig. 2).

8) Transfer sample to reading dish, rinsing out the centrifuge tube with enough tap water to make 15 to 20 cc. in the dish. Count the ova by the use of a stereoscopic microscope, using 18 x or higher. If, through accident, too much iodine fogs the field, it may be decolorized by the addition of 1 to 5 drops of 1 per cent sodium hydroxide without disturbing the efficiency of the test. The total number of ova in the dish equals the number of ova per gram of feces. The fluke ova will be stained a reddish to a dark brown color and are easily seen in the field (fig. 3).

The procedure for field diagnosis is identical with the laboratory method except in the removing of supernatant fluid. A bulb syringe is used or a very careful decanting of the supernatant fluid. In either instance, do not disturb the sediment in the bottom of the tube when siphoning or decanting. In field diagnosis where a stereoscopic microscope is not available, use a low power (50 x) microscope, place a small amount of the fecal debris on a slide, and examine for the presence or absence of fluke ova. The entire sediment should be examined for accurate diagnosis and to determine the ova per gram of feces. The majority of fluke ova will be found on the bottom of the centrifuge tube (fig. 4).

SUMMARY

A simple, efficient method for examining fecal material for fluke ova, requiring twenty to thirty minutes per sample, is described. A series of samples requires very little extra time, as a number of samples may be processed simultaneously. In this method, the ova are stained reddish to a dark brown and are seen on the bottom of the dish in a clear, well-defined field. The fecal debris is small in quantity, clear, and consequently does not interfere with the reading. If air bubbles are present they may be readily pushed aside without any disturbance of the ova in the field.

It has further been found that a special molded, flat-bottomed culture dish scribed with lines ¼ inch apart is most satisfactory for this examination. This dish requires a minimum of microscope adjustment, and the scribed lines guide one in observing and accurately counting the field.

The materials used in this diagnostic test are economical and easily obtained from the usual sources of supply.

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Porcine Pasteurellosis

Half of a herd of 72 pigs about 2 months old died suddenly between Aug. 25 and Sept. 7, 1953 (*Georgia Vet.*, Sept., 1953). They were listless, comatose, with temperatures to 106.8 F., but had no respiratory or nervous symptoms. One sick and 3 dead pigs were submitted to the Animal Disease Laboratory at Tifton. On autopsy, some had massive blood clots in the peritoneal cavity; others showed hemorrhage in or about the organs; and all showed congestion or hemorrhage of the brain, and small white, necrotic areas in the heart and in the kidney, extending the full depth of the cortex. The liver, spleen, kidney and lungs of all were negative on bacterial culture.

Without being tested for sterility, brain tissue from 1 pig was inoculated subcutaneously into a rabbit. The rabbit developed a high temperature and died in forty-eight hours; its brain suspension was inoculated into a second rabbit which also died in forty-eight hours. A third rabbit was inoculated with brain tissue from a second pig. Brain cultures from 3 of the pigs and all tissues from the 3 rabbits later yielded a pure culture of *Pasturella multocida* type 2. Two healthy young pigs were then inoculated subcutaneously, 1 with brain suspension of a field case, the other with a 24-hour culture. The first died in nine days but cultures from the liver, spleen, and brain were negative. However, Pasteurella organisms and staphylococci were isolated from the site of inoculation. The second pig lived.

Foot Rot Prophylaxis.—One pound of Hi-amine fed in 50 lb. of salt may help prevent foot rot in cattle; at least the clients think so.—*J. D. Shuman, D.V.M., Atlantic, Iowa.*

Role of the Sweat Glands in Eczema of Dogs

A Preliminary Report

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THE TERM "eczema" is one which has been used and abused for many decades. For the purpose of this paper and to promote a better understanding of the meaning of this term, it seems well to adopt an acceptable definition. Dorland[4] defines eczema as "An inflammatory skin disease with vesiculation, infiltration, watery discharge, and the development of scales and crusts. The lesions vary much in character, and the disease is frequently attended with restlessness and fever and other symptoms of constitutional disturbance, as well as by local itching and burning."

Eczema in dogs, as well as in man, is believed to arise from many complex reactions of the body's defense mechanism and manifests itself in a great variety of skin lesions. A comprehensive review of the literature reveals the causes of eczema to be many, and they fall into the following groups: allergies, chemical irritants, dietary idiosyncrasies and deficiencies, and infections by microörganisms. Even though numerous factors have been included in each of these etiological categories, there is sufficient evidence to support the belief that there is still another group of causes yet to be determined. A new factor or cause will be discussed in this work and is one which is connected with the sweat mechanism of the dog and its relation to the condition commonly called eczema.

SWEAT GLANDS OF THE DOG

It is generally believed that the dog has sudoriferous glands in the digital pads and nose and that the remaining integument is free of true sweat glands. However, this is an erroneous conception, for it has been proved that sweat glands are liberally distributed over the dog's entire body surface, and that they are of the apocrine type.[8]

Starch-Iodine Reaction.—To demonstrate the distribution of sudoriferous glands in the dog's integument, the starch-iodine reaction[9] is a simple, yet efficient, method. The hair on the area of skin selected is closely clipped. A liberal amount of iodine, 2 per cent in absolute alcohol, is then applied to the skin. After this is allowed to dry, the area is painted with a mixture of equal parts of castor oil and corn starch.

Since direct heat, applied to the skin surface, is one of the best stimuli for sudoriferous glands, an ordinary heat lamp with the rays directed toward the painted area of the skin is used. After a few moments of radiation, the glands begin to function and their secretion is poured onto the surface. The moisture thus produced is clearly visible as it reacts with the starch-iodine compound and yields a black color. The skin site soon becomes densely covered with blackened areas of pin-point size, each representing the secretion from an underlying apocrine gland (fig. 1). Sections of skin examined microscopically confirm the existence of these apocrine glands.

Microscopy.—The sweat glands on the body of the dog are large, slightly coiled, and have an apocrine-type secretion. Although these glands differ greatly morphologically from the common sweat glands of man, they do have a somewhat similar function. In the resting apocrine gland, the glandular cell is definitely columnar in type (fig. 2). As the gland secretes, there is a transverse division of the individual cell's cytoplasm; the deeper half remains as the gland cell and retains the nucleus, and the outer portion is incorporated into the secretion. The result of this process is a gland with extremely low cuboidal cells. In the skin sections taken from cases of hyperhidrosis, in which the glands are secreting to their maximum capacity, the glands are of the low cuboidal type (fig. 3). This hyperhidrotic condition is confirmed clinically by excessive amounts of apocrine secretions found on the skin surface.

Alkaline Reaction.—There are references in the literature to the reaction (pH) of

From the Rowley Memorial Hospital, Springfield, Mass. Sincere gratitude is expressed to Dr. Svend W. Nielsen Department of Pathology, Ontario Veterinary College, Guelph, for the histological examinations cited in this paper; and to Dr. Todd Munson, staff member at the Angell Memorial Animal Hospital, Boston, whose case histories were studied in composure of this paper.

the apocrine gland secretion. It is considered to become more alkaline as greater amounts are produced.

In animals afflicted with hyperhidrosis, with an excess of secretion on the skin surface, the reaction of the moisture is

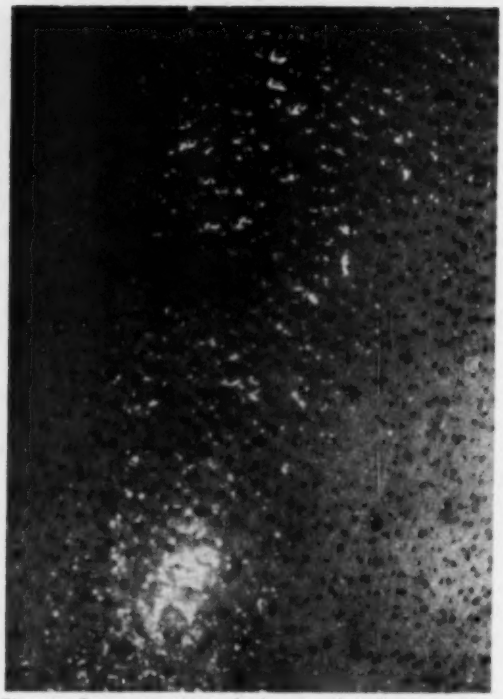

Fig. 1—Demonstration of the starch-iodine reaction on the skin, showing the distribution of the apocrine sweat glands. This area is on the animal's back, near the base of the tail.

determined with litmus paper with a range of 6.0 to 9.0. Some cases of hyperhidrosis may present skin that is absolutely dry at the time of examination. In this circumstance, application of a drop of distilled water on the skin surface will produce a solution suitable for testing. It is necessary to spread this drop of water with a clean spatula before testing with the litmus.

Approximately 100 dogs, some normal and some with hyperhidrosis, have been examined and tested in this manner. It has been determined that normal dogs have a skin reaction between pH 5.5 and pH 7.2; however, those with hyperhidrosis have a reaction between pH 8.2 and pH 9.0.

It has been demonstrated that the superficial layers of the skin are easily destroyed by weak alkaline solutions. A well-known example of this is the development of "dishpan hands" from repeated washings in alkaline solutions of soap. As the apocrine gland secretion increases, there is a characteristic increase in its alkalinity. Therefore, it is reasonable to presume that the excessive alkaline accumulations on the skin of hyperhidrotic individuals may irritate or damage the surface epithelium and greatly influence the development of eczematous skin lesions.

CLINICAL INVESTIGATION

Materials and Methods.—During this study, 243 cases of eczema in dogs were investigated. Each of these animals was diagnosed as having eczema and was hospitalized for treatment at the Angell Memorial Animal Hospital from 1947 to 1952 inclusive. On the basis of the skin lesions presented, they were divided into three groups—moist eczema, chronic eczema, and acute eczema. In each case, the following facts also were recorded: breed, sex, age length of coat, time of year, and duration of the disease.

Moist Eczema.—This type of eczema most frequently occurs at the base of the tail and extends over the lumbar region. Occasionally it is found around the head, usually at the base of one or both ears, and in the region of the neck and shoulders. Moist eczema has a sudden onset and develops to a serious stage in one or two days. The lesion seldom becomes larger than 2 to 4 inches in diameter before the animal's owner seeks the aid of a veterinarian. The area of skin involved is usually denuded and covered with a seropurulent exudate. Beneath the exudate lies a very erythematous, eroded skin surface. The entire area appears as a moist, ugly sore. Intense pruritus is usually associated with these lesions in the early stages; however, after existing a few days they cause the animal a great deal of pain.

Investigation of the cases in this group revealed that breed, age, and sex do not seem to influence the occurrence of moist eczema. In those cases which fell within the scope of the present project, 92 per cent of the cases occurring from June to November were found in a hyperhidrotic condition with a skin surface reaction between pH 8.2 to pH 9.0. Litmus paper was used in this determination and the findings were checked with a Beckman pH meter and found accurate. The remaining 8 per cent of the cases in this group showed no indications of hyperhidrosis but were predisposed to the development of eczema by

some form of trauma to the skin, chiefly animal bite wounds.

Chronic Eczema.—The lesions of chronic eczema vary to a great extent among individuals but, in general, appear to develop in a characteristic manner. First, there is a gradual change in the texture of the hair in the lumbar region; it becomes harsh, dull, and somewhat brittle. This change affects a progressively larger area until it involves most of the animal's back. The first noticeable change in the skin surface is a flaky exfoliation of tissue, accompanied by an aggravating pruritus. Scabs soon appear over the affected area following the trauma inflicted by the dog's nails and teeth in its efforts to allay the itching sensation. The intensity of the pruritus seems to parallel the animal's temperament. The skin surface becomes erythematous in response to the irritation, but the degree of erythema is not always a good measure of the severity of the condition. Close inspection of a case of chronic eczema reveals a very dry, crusty skin surface, completely devoid of sebaceous material (natural skin oil) which ordinarily affords a certain amount of skin protection in normal dogs.

A review of the cases of chronic eczema indicated that the season of the year exerts a great influence on the incidence of this type. Of these cases, 87 per cent occurred between May and October. Of the remaining 13 per cent, many of the animals were strictly "house dogs." With the exception of 2 cases, all animals afflicted with this type of eczema had medium or long hair. Length of hair undoubtedly exerts a great influence on the temperature of the skin.

Of greatest significance is the fact that 72 per cent of all cases of chronic eczema had a skin surface reaction ranging between pH 8.2 and pH 9.0. It is also noteworthy that every animal with chronic eczema was over 1 year of age, supportive evidence for the fact that apocrine sweat

Fig. 2—Normal resting apocrine gland. These tubules are seen to have tall columnar epithelium surrounding small lumina. The cells are dividing in a typical apocrine manner. The nucleus migrates to the bottom and the cytoplasm begins to separate. x 200

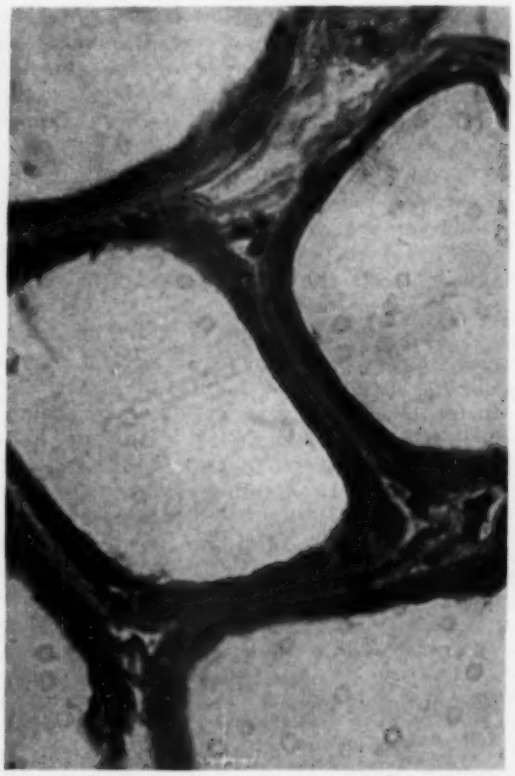

Fig. 3—Hypersecreting apocrine gland. This apocrine sweat gland has cells with flat nuclei and very little cytoplasm. This is the typical appearance of the gland after the cells have discharged the secretion which is in the greatly distended lumen. x 500

glands do not function to their maximum until the age of puberty. Also, apocrine glands do not regress with senility, and chronic eczema was found to affect dogs as old as 14 years.

Acute Eczema.—There is little evidence to indicate that hyperhidrosis plays a role in acute eczema. It is included in this report so that it may be distinguished from the two preceding types.

Acute eczema is of very sudden onset. The symptoms observed by the owner are marked erythema, which can be seen through the hair, and severe pruritus. Usually, there is very little if any loss of hair. The size, shape, and color of the lesions vary greatly from case to case. The season of year, age, sex, and breed seem to have little relationship to the occurrence of acute eczema. It seems to have other causes which are unrelated to hyperhidrosis.

SUMMARY

It is reported that true sweat glands do exist over the entire skin surface of the dog. The distribution of these glands can be illustrated by the use of the starch-iodine reaction. There is a great variation in the number and activity of these glands from case to case. Sections from different areas of skin demonstrate a definite relationship between the amounts of secretion found on the skin surface and the morphology of the glands present. Dogs with hyperhidrosis show histologically the large dilated tubules with low cuboidal cells.

A characteristic property of the apocrine secretion is its tendency to become more alkaline as greater amounts of sweat are eliminated. This excessive alkaline solution irritates the surface of the epithelium, and may cause eczematous lesions. The hypersecretion can be detected clinically by the skin surface reaction (pH), which is easily measured with a litmus paper indicator. Normal canine skin has a pH of 5.5 to 7.2 but in hyperhidrosis there may be a pH of 8.2 to 9.0. Hyperhidrosis is found to be a factor in two of the three types of eczema studied, being prevalent in cases of moist and chronic eczema.

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Cortisone for Snake Bites

Three recent cases of 5-year-old children bitten by copperhead or water moccasin snakes are reported (*J. Am. M. A.*, May 16, 1953). Typical symptoms were burning pain in three to five minutes, then swelling, purplish discoloration, and a hemorrhagic exudate; also weakness, dizziness, perspiration, nausea, and perhaps vomiting blood-stained material. Subcutaneous hemorrhages, bleeding from the nose, and generalized urticaria may develop. Oral doses of 25 mg. of cortisone were given every six hours. Symptoms were checked and the patients were normal in three or four days. Each case had, in addition, received the standard treatment but they responded much more rapidly than did 11 other cases which did not receive cortisone.

Streptokinase-Streptodornase Therapy in Thoracic Empyema

This enzyme combination, often used in septic lesions, makes purulent exudate less viscous and also breaks up loculations. It is used to convert small empyema spaces into one large space, making all parts of the lesion more available to the action of locally instilled antibiotics. Thoracentesis should be done in eighteen hours since the enzyme action is self-terminating and if the lysed material is not removed, redeposition of fibrin will occur. Its action exposes organisms, trapped in the fibrin mesh, to the action of antibiotics. It will also remove fibrin from the pleural surface, enabling a lung to expand and obliterate dead space.—*J. Am. M. A., Oct. 24, 1953.*

Urinary Calculi in Livestock—A New Concept of Its Etiology and Possible Prevention with Hyaluronidase

G. O. PUNTRIANO, D.V.M., M.S.

Laramie, Wyoming

UROLITHIASIS IN livestock still constitutes a problem of considerable proportions in veterinary medicine. Economic losses of sheep and cattle because of this condition reach significant figures every year, especially during the fall and winter when the disease is more prevalent.

The process of kidney stone formation and its treatment have been a subject of extensive research. The medical management of calculous diseases in man has been primarily directed toward attempts to decrease the concentration of crystalloids excreted in the urine, or to free crystalline material from a stone thus causing its disintegration. Such therapeutic measures, however, have not proved completely successful, with the exception of correcting certain metabolic disturbances.

In livestock, the adequate supply of vitamin A in the ration,[1,2] the feeding of balanced mineral rations,[3] and supplying adequate quantities of water,[4] have been shown to be of relative value in preventing urolithiasis, inasmuch as these practices, separate or combined, have not lowered the incidence of urinary calculi.

The surgical approach, consisting of the incision of the urethra and removal of the "stone," is the most usual practice in treating urinary calculi in livestock. This treatment is not completely successful because animals may not fully recover and many show recurrences. The solution of the problem of urolithiasis in livestock seems, therefore, to be in the prevention rather than in the cure.

At the present time, hyaluronidase is being used successfully in man as a therapeutic measure to prevent the recurrence of kidney stones.[5] In livestock, a preventive treatment for urinary calculi could be attempted with hyaluronidase. Supporting this suggestion are the studies on urinary colloids of livestock, the discussion of which will be presented in this article.

The preventive effects of hyaluronidase are linked to the properties of the so-called protective urinary colloids. To consider the role played by these colloids in the prevention of urolithiasis in livestock would require the discussion of the etiology of urinary calculi and the review of the more important physicochemical properties of colloids.

NEW APPROACH TO THE ETIOLOGY OF URINARY CALCULI IN LIVESTOCK

Ultramicroscopic studies of the urine of sheep and cattle, conducted by the author, have shown that the urine of these animals is composed of colloids and crystalloids dispersed in a fluid phase constituted chiefly of water.

The colloidal matter in a drop of urine appears under the ultramicroscope as bright, minute discs, in a dark background, which are in constant zigzag erratic movement; this is known as brownian motion and represents one of the properties of colloids.

The crystalloids are visible in the ultramicroscopic field as very small crystals when a dried film of urine is examined; most of the crystals appear coated by accumulations of colloidal material resulting in cloudlike appearances. This arrangement apparently prevents the growth of crystals into larger stones. The coating colloids which prevent crystal growth are termed "protective urinary colloids."

The above is the picture of normal urine from sheep and cattle. However, when a dried film made up of urine obtained from an animal (steer, for instance) suffering from urinary calculi is examined under the ultramicroscope, the crystalloid matter appears in numerous aggregates of small crystals without protective colloids coating them. These aggregates show a tendency to grow in number and size.

These observations would suggest that, in the urine from normal sheep and cattle, certain colloids, because of their movement and protective effects, contribute to maintain in solution and dispersion the crystalloids in the urine; and that in the urine from an animal suffering from urolithiasis, the protective urinary colloids, being absent or in decreased concentration, would contribute to the precipitation and aggregation of the crystalloids and their growth into larger stones which eventually may develop into urinary calculi.

These observations and suggestions obtained from studies of urinary colloids in livestock are similar to those obtained recently by other

From the Wyoming State Veterinary Laboratory, Laramie. This paper was presented at the twenty-first annual meeting of the Wyoming Veterinary Medical Association at Torrington, Wyo., June 8, 1953.

authors[5,6,14] from colloidal studies on human urine.

The above etiological concept of urinary calculi becomes more complicated, however, when we learn that the urine of livestock is a complex colloidal system in which, along with the concentration of protective urinary colloids, the interplay of nonprotective urinary colloids with the quantity of crystalloids and concentration of the urine should be taken into consideration in the development of urolithiasis.

For the sake of clarity, these latter factors will be discussed separately in the paragraph entitled: "Urinary Calculi and Elements Regulating Their Formation" which follows the review of colloids.

REVIEW OF COLLOIDS

Colloids are generally regarded as extremely small particles suspended in fluid. The particles, which are termed "micelles," are aggregates of a large number of molecules; their dimensions are considered to range from 1 mμ (millimicron) to 500 mμ. Colloidal systems are thus in an intermediary position between the microscopic systems, in which the particles are considered to be larger than 500 mμ and are therefore microscopically resolvable, and the molecular systems in which the molecules are smaller than 1 mμ and are not detectable with microscopy or ultramicroscopy.

One of the properties of colloids is the difficulty of crystallization; this differentiates colloids from the small molecules which have the tendency to crystallize easily. Hence Graham[7] divided all matter into colloids and crystalloids. The molecules of crystalloids are small enough to pass through animal membranes, whereas the colloid particles, supposedly larger than the crystalloids, do not pass through these membranes.

Brownian Motion.—It has been shown that the brownian movement exhibited by the colloidal micelles is due to the actual bombardment of these particles by the molecules of the fluid phase in which they are dispersed. It constitutes a visual demonstration of molecular kinetic energy.

It is possible to count the number of colloidal particles agitated with the brownian movement in the field of the ultramicroscope. This determination is indicative of the so-called colloidal activity which bears relationship with the stability of the colloidal system. The determination of the colloidal activity of the urine is an important factor in diagnosing a tendency toward kidney stone formation.

Surface Tension.—Surface tension is the force exhibited at a liquid gas interphase whereby the liquid tends to reduce its surface to a minimum with the least free surface energy.[8] This phenomenon may be explained as follows: in a body of liquid, the molecules attract each other thus tending to form a sphere or drop with the least possible surface. The resulting force which apparently puts the surface film in a state of tension is termed surface tension.

The determination of the surface tension of a colloidal system would give us information on the amount of active colloidal particles present in that system, inasmuch as there is an inverse relationship between surface tension and amount of active colloidal particles.[9] The determination of the surface tension of the urine, for instance, would give us information on its colloidal activity. Thus, an increased surface tension of the urine indicates a decreased amount of active colloidal particles, and vice versa. This determination is important in the study of the concentration of protective colloids and the tendency toward kidney stone formation.

Hydrophobic (Nonprotective) and Hydrophilic (Protective) Colloids.—Certain colloidal systems owe their stability primarily to the repulsive electrical charges exhibited by their particles. These latter do not show affinity for the liquid phase in which they are dispersed and for this reason these colloids have been termed hydrophobic.[10] Because of their electrical charges, the hydrophobic colloids are sensitive to the addition of small quantities of ions of opposite charge. The neutralization of their electrical charges (iso-electric point) by the addition of electrolytes causes coagulation and precipitation of the colloidal system.

Colloidal systems in which their particles show affinity for the liquid phase in which they are dispersed, and that are not affected by the addition of electrolytes, have been termed hydrophilic colloids.[10] They owe their stability primarily to the affinity of the colloidal micelles for the liquid in which they are dispersed.

By adding an appropriate quantity of a hydrophilic colloid to a hydrophobic colloid, the latter is not only noticeably stabilized against the influence of electrolytes but can now easily be redispersed even after it has been completely dried. Colloids which exert such a protective action on others have been termed protective colloids.[11] Conversely, the hydrophobic colloids could be termed nonprotective colloids.

Urinary Colloids.—From the above review of colloids, we may now describe urine more exactly as a complex solution composed of hydrophobic and hydrophilic colloids and crystalloids. From the etiological point of view of urolithiasis, certain electrolytes of this solution tend to neutralize the electrical charges of the hydrophobic colloids and thus provoke their coagulation, followed by precipitation of the crystalloids, which eventually may lead to kidney stone formation. In the normal urine, however, this does not occur because of the presence of the hydrophilic or protective urinary colloids.

The colloidal matter of the urine is composed of a mixture of a large number of different substances of which nucleic acid, nucleotides, nucleosides, chondroitin-sulfuric acid, glycogen, mucin, and a complex amino carbohydrate have been found.[12] A hyaluronidase substrate has also been found as a component of normal urine,[5] to which an important role has been attributed in maintaining the proper colloid-crystalloid balance in

the urine. This seems to be significant when we consider that hyaluronidase is being used to prevent urolithiasis in man.

The colloidal matter of the urine has been shown to increase in man as a result of a diet rich in protein, particularly meat.[12] In livestock, it would be of great importance to determine the relationship between concentration of urinary colloids, especially the protective ones, and nutrition. According to Butt,[12] urinary colloids are increased in certain diseases, such as pneumonia, and in acute or chronic inflammatory diseases of the kidneys.

In man, it has been shown that the protective urinary colloids are more abundant in females than in males, and that this concentration increases during pregnancy.[6] This may explain the frequency of cases of kidney stones in men as compared with women. In livestock, the incidence of urinary calculi seems to hold to a similar sex relationship. Steers and wethers are the most affected by urinary calculi. Although no statistical determinations on the concentration of protective urinary colloids in females and males has been made in livestock as yet, it would be interesting to keep in mind the possible relationship of sex, concentration of protective urinary colloids, and incidence of urinary calculi.

URINARY CALCULI AND ELEMENTS REGULATING THEIR FORMATION

Kidney stones may be defined as a concretion formed of urinary crystalloids bound together by, and incorporated in, a colloidal matrix. As discussed before, renal calculi would appear when the concentration of the protective or hydrophilic colloids is insufficient in the urine. This causes a crystalloid-colloid imbalance which, in turn, causes the development of renal calculi. This latter may be brought about either by the growth of crystals from a highly concentrated electrolytic solution, or by the agglomeration of the inorganic colloidal particles due to the neutralization or reduction of their electrical charges in the presence of a high concentration of electrolytic counter ions. In the latter case, the hydrophobic colloids may become deposited on a renal papilla or sediment in the deeper portions of the calyx or pelvis and there act as a cementing substance which holds the crystalloids together and thus aids in the formation of kidney stones.[13]

From this knowledge, it would appear that several regulatory factors should be considered in the formation of urinary calculi. These factors as mentioned before are: concentration of protective urinary colloids, quantity of crystalloids, and concentration of the urine.

Concentration of Protective Urinary Colloids.—A sufficient concentration of protective urinary colloids would play an important role in preventing urolithiasis, especially when electrolytes and water in the urine are in unbalanced proportions. The protective urinary colloids, as mentioned before, exert their effect on the hydrophobic or nonprotective urinary colloids by stabilizing them against the coagulating effects of certain electrolytes of the urine. This protection is explained schematically[11] in figure 1.

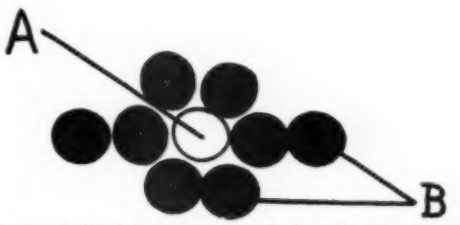

Fig. 1—Colloidal protection: (A) colloidal particle to be protected; (B) particles of protective colloids.

It may be observed (fig. 1) that the particles of protective colloids B surround the particle of the colloid to be protected, A (hydrophobic), thus forming a thick layer. This layer provides the hydrophobic particle with the properties of the protective colloids and therefore this particle is no longer affected by the neutralizing tendencies of the electrolytes.

In the absence of protective urinary colloids, no possible protection of the hydrophobic colloids of the urine would occur. However, when the protective urinary colloids are in insufficient concentration in the urine, not only a decrease of its protective effects would be noticeable, but also the stability of the hydrophobic colloids under the influence of electrolytes would be decreased even below their natural stability. This phenomenon known as "sensitization"[14] is explained schematically in figure 2. It can be observed (fig. 2) that, because of a supposed insufficient concentration of protective colloidal particles B, the colloidal particles to be protected, A (hydrophobic), relatively greater in number, surround the former and thereby increase their surface of exposure to the electrolytes of the urine. This causes a decrease of stability of the

hydrophobic colloids due to the relatively increased coagulating effects of the electrolytes on these colloids. In other words, an insufficient concentration of protective urinary colloids would produce a reversal of protective effects.

Experimental Use of Hyaluronidase in Livestock.—It has been observed that when the enzyme

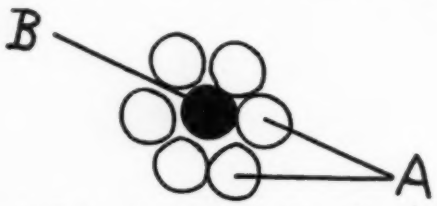

Fig. 2—Phenomenon of sensitization: (A) colloidal particles to be protected; (B) particle of protective colloid.

hyaluronidase is injected in man subcutaneously in a suspension of saline solution, it acts as protective urinary colloids when eliminated by the kidneys as hyaluronic acid or a hyaluronidase derivative.[6] This property of hyaluronidase has recently been successfully used in man to prevent the recurrence of kidney stone formation,[8] because this drug prevents the coagulating properties of certain electrolytes in the urine.

Inasmuch as the author found that the physics of colloids in the urine of sheep and cattle were similar to those in man, the possibility of using hyaluronidase in livestock to prevent urolithiasis was considered.

With this purpose in mind, a preliminary experiment to evaluate the effects of hyaluronidase in the urine of sheep and cattle was conducted. The evaluation was made by submitting the urine from normal untreated animals, normal hyaluronidase-treated animals, and animals suffering from urinary calculi, to several colloidal tests such as: urinary turbidity, colloidal activity, surface tension, and ultramicroscopic examination of dried films of urine.

Urinary Turbidity Test.—This test is performed by injecting, subcutaneously, hyaluronidase suspended in saline solution, then comparing the clarification and sedimentation of several samples of urine collected from the animal at intervals over a period of twenty-four hours.

In human beings suffering from kidney stones, it has been shown that a maximum clarification and dispersion of the sediment of the urine occurs between two to four hours after the subcutaneous injection of 150 TRU (turbidity reducing units) of a commercial hyaluronidase suspended in 1 cc. of saline solution.[8] In sheep, after several trials, the author found that the maximum clarification of the urine occurred three hours after the subcutaneous injection of 150 TRU of a commercial hyaluronidase (suspended in 1 cc. of saline solution), and in cattle the maximum clarification occurred between five and six hours after a similar injection of 300 TRU.

The clarification of the urine demonstrates the increase in solubility and dispersing properties of hyaluronidase on the crystalline matter of the urine. Thus, it would appear that the dispersing and solubility properties of hyaluronidase are similar for the urine of man and livestock.

Colloidal Activity Test.—Colloidal activity is determined by counting the number of colloidal particles intermittently present in the ultramicroscopic field. The colloidal activity was graded from zero to five; zero representing no colloidal activity; grade 1, representing one to ten particles constantly present in the field; grade 2, 11 to 25 particles per field; grade 3, 26 to 40 particles per field; grade 4, 41 to 55 particles per field; and grade 5, more than 55 particles per field.

The urine was prepared by ultracentrifugating 10 cc. of urine at 40,000 r.p.m. for fifteen minutes, then adding 0.25 cc. of a 25 per cent phenol solution. The tube was then stoppered and the contents shaken briskly. A drop of the urine thus prepared was examined under the ultramicroscope for the colloidal activity determination.

The colloidal activity of the urine from 1 healthy wether, 1 healthy ram, 3 healthy ewes, 3 healthy steers, and 3 steers suffering from urinary calculi was determined. Then the colloidal activity of the urine of all the above animals with the exception of the sick steers was determined again, following the subcutaneous injection of 150 TRU of hyaluronidase solution to each of the sheep, and 300 TRU to each of the steers. Determinations of the colloidal activity were made from the urine collected three hours after the administration of the hyaluronidase to the sheep and five hours after the similar injection to the steers.

The urine from the 3 steers suffering from urinary calculi was sent to the author by mail and a treatment with hyaluronidase was not possible.

TABLE 1—Results of the Colloidal Activity Test on Urine of Sheep and Cattle

Subject	Grade of colloidal activity of urine	
	Untreated animal	Hyaluronidase-treated animal
Healthy wether	3	4
Healthy ram	3	4
Healthy ewe	4	5
Healthy ewe	3	4
Healthy ewe	4	5
Healthy steer	3	5
Healthy steer	3	4
Healthy steer	3	4
3 sick steers*	1, 1 and 2	

*Suffering from urinary calculi.

From the results reported in table 1, it would appear that in the healthy, untreated wether, ram, and steers, grade 3 of colloidal activity could be considered as normal, but in healthy, untreated ewes, grade 4 of colloidal activity was more frequently found. However, in steers suffering from urinary calculi, a variable decrease in col-

loidal activity was found. Hyaluronidase administration to healthy sheep and steers regularly increased the grade of colloidal activity of their urine, which could be interpreted as an increased protection exerted by hyaluronidase in the urine and thereby an increased resistance to kidney stone formation.

Surface Tension Test.—The surface tension was determined by counting the number of drops obtained from a capillary pipette thirty seconds after filling the pipette with the urine sample. After each determination, the pipette was rinsed with distilled water. The urine was prepared by ultracentrifuging at 40,000 r.p.m. for fifteen minutes so that all visible matter seen with the aid of the ultramicroscope was removed. Surface tension was determined on specimens of the same urine of the same animals used in the previous experiment.

There is an inverse relationship between the number of drops of urine obtained from a capillary pipette in thirty seconds and the surface tension of that urine; an increased number of drops indicating a decreased surface tension. In turn, there is an inverse relationship between surface tension and the amount of active colloidal particles of the system determined;[5] thus, the number of drops and amount of active colloidal particles of a system are in direct relationship. From the results reported in table 2, it would appear that a decreased amount of active colloidal particles in the urine of the steers suffering from urinary calculi was noticed as compared with the urine from normal, untreated steers and sheep; and that hyaluronidase increased the amount of active colloidal particles of the urine of the normal wether, ram, ewes, and steers by reducing the surface tension of their urine. This latter result would be interpreted as an increased protection exerted by the hyaluronidase in the urine and, thereby, an increased resistance to kidney stone formation.

Ultramicroscopic Examination of Dried Films of Urine.—Dried films made up from specimens of the same urine of sheep and cattle as used in the above tests were examined under the ultramicroscope before and after the hyaluronidase administration. The crystals of the urine from the healthy, untreated sheep and cattle appeared coated by a moderate amount of protective colloids; in contrast, the crystals of the urine from the same animals after the hyaluronidase treatment appeared coated by noticeably increased amounts of protective colloids. Furthermore, the crystals in this latter case did not show as much growth as the crystals in the urine from the untreated animals. This constitutes an objective demonstration of the protective effects exerted by hyaluronidase in the urine of livestock.

The urine from the healthy animals before and after hyaluronidase treatment was used for determining qualitatively the albumin, ketones, and sugar values, and quantitatively the pH. It was found that no significant changes in these values occurred in the urine of the animals after the hyaluronidase administration.

It has been shown that hyaluronidase administration in man, besides decreasing the turbidity of the urine, decreases its surface tension and increases its colloidal activity.[5,6] These results are similar to those obtained in livestock.

TABLE 2—Results of the Surface Tension Test on the Urine of Sheep and Cattle

Subject	Surface tension of urine expressed in ave. No. of drops obtained in thirty seconds	
	Untreated animal	Hyaluronidase-treated animal
Healthy wether	16	20
Healthy ram	16	19
Healthy ewe	17	20
Healthy ewe	17	20
Healthy ewe	16	18
Healthy steer	18	20
Healthy steer	18	21
Healthy steer	17	20
3 sick steers*	11, 13 and 14	

*Suffering from urinary calculi.

HYALURONIDASE IN LIVESTOCK AS A PREVENTATIVE OF UROLITHIASIS

From the experiments reported concerning the decrease in turbidity, increase in colloidal activity, and decrease in surface tension of the urine of sheep and cattle, it would appear that hyaluronidase in livestock would prevent the formation of urinary calculi as it does in man. The administration of this enzyme during the fall season could be beneficial in preventing urinary calculi in livestock. Daily injections could be replaced by the implantation of pellets of hyaluronidase. This would provide a retarded absorption from the tissues. At the present time, the author is conducting experiments with pellets of hyaluronidase implanted in the necks of sheep.

One important factor in the use of this enzyme in livestock is the determination of the correct dosage. An adequate dose would be essential for successful prevention of urinary calculi, because an inadequate dosage might result in the exact reverse of the conditions desired. The reason for this is the phenomenon of so-called "sensitization" of colloids.[14]

Quantity of Crystalloids.—That kidney stones may result from a crystalloid-colloid imbalance has also been discussed. This could be brought about by a ration excessively rich in some minerals. The forced feeding of minerals to livestock, for instance, is sometimes followed by the incidence of cases of urinary calculi.[15]

Inasmuch as the composition of calculi in livestock has been found to be largely phosphates of calcium or magnesium, silicates of calcium, magnesium, and/or aluminum,[15,16] it has been thought that the high contents of phosphates, calcium, magnesium, etc. of the ration might be responsible for the formation of urinary calculi. Experimental feeding trials with a separate or combined use of these elements have, however, shown inconsistent results.[3,17] The explanation of this seems to be the presence of varied concentrations of the protective urinary colloids in the urine of the animals under experiment.

Thus, from a colloidal point of view, the increased quantity of certain electrolytes in the urine may cause the hydrophobic colloids to coagulate if the concentration of the protective colloids is insufficient. This would result in precipitation and growth of the crystalline matter into larger aggregates which might eventually develop into kidney stones. However, when the increased quantity of the same type of electrolytes in the urine occurs in the presence of sufficient concentration of protective colloids, precipitation and stone formation from the crystalline matter will be prevented.

Concentration of the Urine.—The concentration of the urine depends mainly upon the amount of water present. This may be a factor in the etiology of urinary calculi, inasmuch as the relative concentration of the electrolytes and the activity of the protective colloids is affected by the quantities of water present in the urine.

Thus, during dehydration of the body, urine becomes more concentrated. This relatively increases the electrolytes and decreases the stability of the colloidal system of the urine, thereby increasing their precipitation and the tendency toward urinary calculi formation.

The relative increase of electrolytes during concentration of the urine is a simple physical process. However, the decreased activity of colloids observed during concentration of the urine, especially of the protective ones, results from their affinity for the water in which they are suspended. The colloidal activity decreases as the water decreases in quantity.

A decreased supply of water, however, is not always followed by kidney stone formation. A sufficient concentration of protective urinary colloids may preserve the crystalloid-colloid balance in spite of urinary concentration and the relative increase in electrolytes.

This may explain the inconsistent results obtained in livestock in which the water supply was investigated. In a recent experiment reported from Montana,[18] it was concluded that negative results for urinary calculi formation in cattle were obtained by decreasing the water supply to the necessary minimum quantities. On the other hand, it is commonly observed that sheep and cattle which drink decreased amounts of water during the winter months are frequently affected with urinary calculi.

In human beings living in subtropical areas, it has been observed[13] that during the months of May through August, when an excessive perspiration of the body occurs, the incidence of kidney stones is more prevalent. Excessive perspiration causes body dehydration and makes the urine more concentrated. Some of the more insoluble salts may then be precipitated if an insufficient concentration of protective urinary colloids is present. This process is more pronounced in northern residents who have recently arrived in the tropical or subtropical areas, apparently because their adaptive mechanism for water distribution in the body may not then be well adjusted.

Nutrition may constitute one of the chief factors in determining the concentration of protective urinary colloids. In livestock, it would be of great importance to determine the relationship between the concentration of urinary colloids, especially the protective ones, and nutrition. Then, an attempt should be made to select foods which will increase the concentration of protective urinary colloids.

Other factors have also been shown to be important in the regulation of the amount of colloids in the urine. It has recently been observed, for instance, that in man the formation of protective colloids virtually disappears during times of strong emotional stress.[19] Similar stresses in livestock could be a factor in the increase in urinary calculi in sheep and cattle exposed to a severe winter, storms, or other weather inclemencies.

Finally, the concentration of protective urinary colloids could be relatively decreased by an abnormal increase of nonprotective colloids in the urine. The result

would be the phenomenon of "sensitization" and a tendency toward kidney stone formation. It, therefore, would be important to determine in livestock, what pathological or physiological processes of the body result in an increase of the nonprotective colloids.

SUMMARY

Ultramicroscopic studies of the urine of sheep and cattle have shown that the urine of these animals is composed of a complex solution of hydrophobic and hydrophilic colloids and crystalloids. Certain electrolytes of this solution tend to neutralize the electrical charges of the hydrophobic colloids and thus provoke their coagulation, followed by the precipitation of the crystalloids which eventually may lead to kidney stone formation. In normal urine, however, calculi do not form because of the adequate presence of the hydrophilic or protective urinary colloids.

The use of hyaluronidase in livestock to prevent urolithiasis is suggested by the results obtained in tests on the ultramicroscopic examinations of dried films of urine, the urinary turbidity, colloidal activity, and surface tension of the urine of man, as well as the urine of sheep and cattle. The dosage of hyaluronidase is important because of the possible reversed effects due to the phenomenon of "sensitization" of the colloids. The use of pellets implanted subcutaneously in livestock is suggested.

Experimental feeding trials with various minerals, and with varied quantities of drinking water have shown inconsistent results in the production of calculi in the past. A variation in the concentration of protective colloids in the urine of the animals under experiment could possibly explain this inconsistency. This suggests that the concentration of protective urinary colloids, quantity of crystalloids, and concentration of the urine may be factors in the etiology of urinary calculi. Nutrition may constitute one of the chief factors in determining the concentration of protective urinary colloids in livestock and, thereby, in the incidence of urinary calculi. Environmental stresses such as weather inclemencies may also influence the concentration of protective urinary colloids. Also the pathological increase of nonprotective colloids in the urine may result in a relative decrease of protective urinary colloids followed by a tendency toward kidney stone formation.

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Irradiation of Large Animals

Experimental studies have been made on 150 irradiated burros at Oak Ridge, Tenn. It is indicated that the radiation syndrome, the symptom complex following total whole body radiation, is the same whether the source be an atom bomb, a chain-reacting pile, a decaying radioisotope, an x-ray tube, or a device such as the cyclotron or betatron. Radiations are always injurious to the cells which absorb them and the injury may be transitory or permanent.

Following total body radiation, instantaneous death has not been reported in larger animals but, later, death has often occurred unexpectedly. In the studies reported here, some died without evidence of illness but early deaths were usually preceded by collapse and coma. Those which died a week after exposure usually exhibited necrotic ulcers of the digestive tract, especially in the mouth. Some animals temporarily recovered, then gradually weakened and died, with evidence of aplastic anemia and hemorrhage. No deaths occurred after forty-five days. Affected animals became irritable and often developed a shifting leg lameness and a jerking, string-halt movement, as well as epilation, edema, and occasionally hemorrhage through the intact skin. Wounds did not suppurate but sloughed considerably and terminal cases occasionally bled profusely. Conjunctivitis, sometimes with excessive edema, and keratosis were common.

Estrus was not inhibited but only 1 of 36 females autopsied did not have cystic ovaries; many cysts were filled with blood. Fertility was not tested. In males, the testes were usually drawn to the inguinal canal. Cellular elements of the blood were reduced. Many burros exhibited symptoms characteristic of encephalitis: pressing forward, circling, with occasional paralysis of the tongue or lips. Goats, pigs, and dogs exhibit similar effects except for the neuromotor symptoms. Bacterial invasions complicate the syndromes. Swine surviving the ulcerated lesions frequently succumb to secondary infections, and massive bacterial invasion of the canine tonsils may be fatal.

No symptom, unless it be the type of blood-clotting defect, is characteristic of radiation injury for all large animal species.—*Military Surgeon, 112, May, 1953.*

Psittacosis in Man

Ten persons with evidence of having had psittacosis were seen in Pittsburgh in the past year, seven of whom had contact with a parakeet. There was a great variation in the clinical appearance and the toxicity of the disease, young people being more mildly affected than older persons. The one fatal case was a 58-year-old man who was ill for one week but continued work until the next to the last day. He died of double pneumonia and pulmonary edema. Four days before his death, his son developed a sore throat which continued for five days but with no other symptoms except a temperature of 102 F. for two days. Three days before his death, his 17-year-old daughter was awakened with an intense headache which continued for five days. She had no other symptoms except a four-day fever with a maximum of 103 F.

Three weeks before the man's death, the son had bought a parakeet at a five-and-ten-cent store. Although apparently well, the bird was killed and sent to the U. S. Public Health Virus Laboratory in Montgomery, Ala., along with necropsy specimens from the man. Psittacosis virus was grown from all specimens. Three other members of the family were not sick but two were positive to the complement-fixation test.

A woman, who bought a parakeet five weeks previously was ill about ten days with fever, aching muscles, and headaches. A young man who had purchased parakeets thirteen days previously was ill for two weeks with headache, chills, fever, muscular aches, and pneumonia. However, his spleen was never palpable. One bird had died, the other 2 yielded psittacosis virus. The other three cases had no contact with birds but were positive to the complement-fixation test. In only one could an enlarged spleen be palpated. It was difficult to assess the value of antibiotics but penicillin seemed beneficial. While contact with various birds can often be established, there are reports of person-to-person infection, such as three nurses, two of them dying, being infected by one fatal case.—*Am. J. M. Sci., Aug., 1953.*

NUTRITION

Salt, Indispensable, Yet a Poison

Many, while observing the irreversible anguish and death of swine poisoned by an essential food—sodium chloride—have wondered what quirk of nature has consigned them so often to this tragic fate which other animals seem to escape. However, Pistor, *et al.*[1], in 1950, stated that ruminants occasionally are poisoned by salt, and reported details on a few cases produced experimentally.

Their research had been stimulated by an ingenious labor-saving practice, originated many years ago by sheepmen, whereby salt was mixed with a concentrate to limit consumption of the latter when self-fed on the range. Range cattle often consume 2 to 3 lb. daily of a 30-70, salt-concentrate mixture for long periods without ill effects. This would be up to 1 lb. of salt daily, a quantity long considered a cathartic dose. Under similar circumstances salt consumption, by the free choice method, probably would have been considerably less than 2 oz. per day.

It was learned that sodium chloride, unlike any known substance except fatty acids, was readily absorbed from compartments of the ruminant stomach but excesses were immediately secreted by the kidneys. However, the urine apparently could carry not more than 2.4 per cent of salt and if absorption exceeded secretion, the salt content of the blood increased, resulting in intoxication. The limiting factor, therefore, was water consumption, about 5 gal. being required to produce sufficient urine to eliminate each pound of salt consumed. This would be the equivalent of drinking a 2.5 per cent solution, if no other salt were consumed. Cows have also been given only water containing 2 per cent salt for twenty-one months, goats, 2.5 per cent for long periods, without harm.

In this experiment, cows were dosed with 2 lb., goats with 5 oz. of salt without harm if available water was unlimited. However, if water was limited to 3 gal. for the cow, 3 pints for the goat, signs of poisoning would appear in eight to ten hours, followed by death a few hours later, unless the salt was washed from the rumen.

The first signs of poisoning were anxiety and hypersensitivity followed soon by trembling, increased rumen activity, bloating, incoördination, loss of equilibrium, coma, and death *without struggling*. Blindness was not observed. Necropsy revealed only a slight congestion of the mucosa of the stomach compartments, and an edematous but not inflamed duodenal mucosa. The kidneys seemed to be normal.

The Susceptibility of Swine

Carnivorous animals require less free salt than do herbivorous animals, so that swine, being omnivorous, should have less of an appetite for salt than ruminants. Yet, perhaps because they are "hoggish," they more frequently are poisoned by salt, as could be attested by many case reports similar to the following.

Case 1.—In March, 1940, 20 shoats, averaging 150 lb., which had been given no free salt for a month, were given access to a commonly used mixture of equal parts of ground limestone, bonemeal, and crushed rock salt. In twenty-four hours they consumed the entire 4.5 lb.—1.5 lb. of crude salt for 3,000 lb. of hog, or only 1 Gm. to 4 lb. (Bolin[2] reports that pigs (and lambs) can survive 1.5 Gm. of salt per pound, but not 2 Gm.) These hogs had access to ample water. By the thirty-sixth hour, 1 showed mental symptoms and by the sixtieth hour it was dead, and 3 others exhibited typical, terminal nervous symptoms—constant running motions for hours while prone, with occasional spasms.

Case 2.—In December, 1943, hemorrhagic dysentery appeared in a lot of about 50 fall pigs. Feed was withheld for a day and to get quick medication they were given 1 lb. of table salt to each 5 gal. of drinking water (2.5%) to be discontinued in about six hours. However, on the theory that if a little is good, more is better, the owner continued giving this salt water. By the forty-eighth hour, 1 pig was dead. The salt was removed but the pigs continued to sicken for twenty-four hours, and all but a few that sickened died. They were blind, nonsensitive, frothing at the mouth, twitching, sitting, circling, or trying to push

through or climb over walls. The dysentery was cured but a third of the herd died.

Case 3.—Giving pigs affected with enteritis 0.5 to 1.0 lb. of salt per bushel of grain, preferably oats, for several days has long been a common, beneficial practice. Therefore, in July, 1951, about 120 pigs, threatened with enteritis, were shut on a concrete feeding floor, watered in troughs by hand, and fed a mixture of 1 lb. of salt per bushel of home-raised feed. In forty-eight hours, 2 were dead and 11 had started that "pickled brain," aimless, death march. Investigation revealed that the mixing probably was not uniform so that some pigs got more salt than intended. A wide variety of treatments tried in these and other cases had never demonstrated positive value.

Crushed rock salt has seemed to be more dangerous for pigs than refined salt. If so, this could be because of impurities or because it is dissolved and absorbed more slowly so that toxic quantities might be eaten before the animal's appetite would be satisfied.

The lack of an ample supply of fresh water would explain some but not all salt poisonings. More thorough research on salt poisoning, especially in swine, is needed.

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Making Cattle Feed from Sawdust

Many animals can digest cellulose but not wood, because of its lignin and other content. However, by means of electron irradiation wood can be changed so that it can be digested by cattle. Meanwhile, investigations continue with torula yeast, a wartime European product resulting from the treatment of wood pulp with sulfite. Unlike ordinary yeast, torula yeast is inactive but it contains about 45 per cent protein plus vitamins.—*The Cattleman, Nov., 1953.*

Vitamins and Hormones.—There is no truth to the belief which exists at some of the race tracks that vitamins or hormones can stimulate a horse to run faster or that testosterone could prevent a mare from breeding during her racing career.—*W. H. Wright, D.V.M., in Blood Horse, Oct. 3, 1953.*

Anemia in Dogs Caused by Copper and Iron Deficiency

The classic changes in the peripheral blood of dogs, when experimentally produced by an iron deficiency, reveal normal numbers of red blood cells but a marked reduction in their size, hemoglobin content, and hemoglobin concentration. Conversely, anemias produced by copper deficiency are characterized by a reduced number of erythrocytes with relatively normal red cell indexes.

In iron deficiency the bone marrow shows a hyperplasia of hemoglobin-deficient normoblasts and no evidence of hemoglobin deficiency, but there is a defective development of cells. Irrespective of copper's role in the metabolism of iron and in the formation of hemoglobin, it apparently is essential for the normal maturation of erythrocytic elements and the production of a normal number of red blood cells, at least in the dog.—*J. Am. M. A., Oct. 31, 1953.*

Feeding Soil for Turkey Arthritis.—Placing soil in turkey feed reduced the incidence of swollen hocks in a North Carolina experiment. When soil replaced 7 per cent of the mash, swollen hocks were reduced from 85 per cent to 29 per cent. This was much more effective than adding either vitamin B_{12} or 11.9 Gm. of terramycin® to a ton of feed. Reasons for the benefit have not yet been determined.—*Farm J., Sept., 1953.*

Nitrofurazone in Poultry Rations

Sulfonamides are effective in the control of avian coccidiosis but, if medication is prolonged, they may cause retarded growth and, at times, hemorrhages and decreased clotting rate of blood. Nitrofurazone has shown coccidiostatic efficacy at a level of 0.0055 per cent of the mash. On an optimal riboflavin diet it produced a decline in growth rate at or above a 0.02 per cent level and toxic reactions at 0.04 per cent. To further test its toxicity, 30 baby chicks were fed a 0.011 per cent level mash for sixteen weeks. Neither toxicity nor coccidiosis was observed. The growth rate was normal but the hatchability of eggs from treated birds was slightly less than that of the controls.—*Vet. Rec., Sept. 5, 1953.*

EDITORIAL

1953 In Retrospect

Pity the weatherman who is expected to peer into the future and predict the days on which we should wear our rubbers or plan our vacation trips. Much easier is his job of reviewing the weather which has transpired. We will not risk any predictions as to the problems for veterinary medicine in 1954 but we might profit from a quick over-the-shoulder "look-see" at the obstacles which have recently confronted us and how they have been met.

The past year, 1953, found veterinary problems making less front page news than in 1952 when we were bombarded with a series of epizoötics; in contrast, 1953 might be described as a year of unspectacular progress. The diseases which invaded the continent's domestic animal domain in the previous year or more have either been wiped out or reduced and contained.

Vesicular Exanthema and Anthrax

In 1952, the disease getting the most headlines probably was vesicular exanthema of swine which had exploded across the country in June and in twelve months had been diagnosed in 41 states. It was usually quickly eradicated from all but eight states. Most of these eight states do a lot of garbage feeding and three are among the eight which have not yet adopted garbage-cooking laws or regulations. It is significant that even though ten bordering states were affected, the disease did not cross into Canada, presumably because of garbage-cooking requirements there.

Anthrax also caused great concern during 1952, when 3,451 cases, mostly in swine in clean areas, were reported in 432 counties of 32 states. In contrast, in the first ten months of 1953 the loss reported was about 600 animals in 215 outbreaks in 25 states. Most of these were cattle and, reassuringly, few of the outbreaks were on recently contaminated premises.

Scrapie and Bluetongue

Two sheep diseases, diagnosed for the first time in the United States in 1952, proved to be not new on this continent. Scrapie, the chronic neurosis, had been diagnosed in Canada as early as 1945. Although it was quickly stamped out in the three states where it appeared, a constant vigil will continue for years lest it reappear. Its long incubation period and the ability of the parent to transmit it to the offspring before the former develops symptoms would mean that a lamb might be infected through its dam before she or the infecting granddam developed symptoms.

Bluetongue, reported from five southwestern states, apparently had been in some of those states, diagnosed as "soremuzzle," since 1948. Probably more than a million sheep have been affected, with the loss from debility exceeding that from deaths. In 1953, the disease was more prevalent in some states, but less in others. Two weapons for controlling bluetongue should soon be available: (1) a vaccine prepared from the involved species of the virus; and (2) insecticides for the insect vectors. The *Culicoides variipennis* has been identified as a vector in Texas.

Foot-and-Mouth Disease

Foot-and-mouth disease (aftosa) reappeared in Mexico in May, 1953. Although the eradication program has been diluted, the disease is being contained. The Canadian border was opened March 1, 1953, one year after their epizoötic was eradicated.

Incidence of Other Diseases in 1953

In the absence of an adequate reporting system, the incidence of most other animal diseases can only be estimated.

Shipping fever in cattle, a disease long dealt with by supposition rather than by science, is finally being thoroughly investigated. Recent controlled tests indicate that recommended antiserums, like bacterins, have little or no prophylactic value. Until the cause is revealed, progress with prophylactic biological products can not be expected.

Bovine leptospirosis has now been identified, serologically at least, in 40 or more states and Canada. The only logical control

means yet proposed is prophylaxis for which purpose a *Leptospira pomona* bacterin has been produced. Equine, ovine, and porcine leptospirosis, also caused by *L. pomona*, have been reported. In one stable of horses, leptospirosis was associated with periodic ophthalmia. In sheep it caused abortions and death. The clinical picture in swine is not fully established but frequently, as in some bovine cases, the only sign may be abortions. Apparently, man rarely contracts leptospirosis from these animals. Antibiotic therapy seems to have little value. Even in canine leptospirosis, caused by different species of the organism, their value seems to have been overrated.

Hog cholera, in June, 1953, made its first appearance in Canada since 1946. Although it spread through sale barns to several counties before being recognized, it was eradicated in about a month. In the United States, with fewer swine vaccinated, the decrease since 1952 in the use of virulent virus was about 40 per cent; of antiserum about 28 per cent. The use of modified vaccines increased about 55 per cent. Developments which should facilitate the control of cholera include: the passage of garbage-feeding laws or regulations by 40 states; the outlawing of virulent virus in two states (Tennessee joined Alabama on Jan. 1, 1954); and plans, in the making, for eradication of cholera from a few pilot areas.

Recent swine erysipelas research with the skin scarification immunity tests should lead to improved vaccination methods and perhaps to information on how and from whence the disease is transmitted, be it soil reservoirs, chronic carriers, acute cases, or other possible sources.

Atrophic rhinitis remains a serious and vexing swine problem with evidence presented in support of three distinct etiological factors. Recent developments which may aid in its control include the rhinoscope for physical detection of infection, and evidence that infection survives less than three weeks in contaminated quarters.

Toxoplasmosis caused by a sporozoon, *Toxoplasma gondii*, has been found in several herds of cattle and swine. It affects all ages but more frequently younger animals, some being congenitally infected, showing symptoms the day of birth. Fever, dyspnea, nervous symptoms, coma, and usually death in several days were observed. Man, dogs, and many small animals and birds are also susceptible. In canine experiments, abortions and congenital infections were produced. The milk of infected animals, some without symptoms, carried the organisms. Human cases may develop encephalitis. Some such occurred on the same premises as canine cases.

A rabies epizoötic of serious proportion, originating in wild animals of northwestern Canada, was controlled chiefly by vaccinatings dogs and trapping or poisoning over 46,000 wild animals. Rabies was also reported in racoons and bats in a southeastern state.

Vibrio fetus infection in ewes which has caused the loss of more than 100,000 lambs, via abortion, in the Rocky Mountain states, was less prevalent in 1953. Extensive cooperative research is underway in that area.

Trichloroethylene-extracted soybean meal was shown in 1953 to be poisonous for sheep, as it has been for cattle and horses. However, no naturally occurring cases were reported in 1953.

Hyperkeratosis was very prevalent in cattle in the southwestern drought area early in 1953, apparently due to feeding cottonseed pellets contaminated with chlorinated naphthalene. Liberal vitamin A therapy was found to retard the development of the hyperkeratosis syndrome and to have therapeutic value if the poisonous feed was removed soon enough. It was found that the characteristic proliferative mouth lesions could be produced independently by a virus in young calves, but in older cattle only when they were on a hyperkeratosis-producing ration.

Ketosis in milk cows was found to respond more markedly to ACTH or cortisone therapy than to sodium proprionate or to glucose, but the latter are still adequate therapy for many cases and are valuable supportive therapy in all cases. Aspirin can be substituted for part of the cortisone to reduce the cost of treatment. ACTH and cortisone were also demonstrated to be of value in treating certain cases of arthritis in horses, cattle, and dogs, as well as for inflammation of the eye in a dog, especially for iritis.

ARTIFICIAL INSEMINATION

New developments in artificial insemination included the use of semen which had been preserved at -79 F., with about 300 calves produced and 3,000 cows bred. Cows

have also been fertilized with semen which had been held at -192 F. Antibiotics were extensively used in semen to prevent collateral infection. Larger doses of antibiotics introduced into the uterus a day or two after insemination has been tried on a few repeat breeders.

Avian Diseases

In poultry, respiratory diseases were of major concern in 1953. The use of living vaccines for Newcastle disease and infectious bronchitis were approved if used only in infected areas. There was little new information on chronic respiratory disease.

Bluecomb disease assumed alarming proportions in some areas. There was some evidence that it might be an infection, also that antibiotics had some therapeutic value.

A hemorrhagic disease of young chickens, possibly associated with vitamin K deficiency, raised concern lest the feeding of antibiotics or detergents might be an etiological factor.

Psittacosis, especially in parakeets, seemed to be increasing, probably often introduced with smuggled birds. It (ornithosis) was also identified in turkeys, pheasants, and ducks. Several human cases were reported, some of them fatal.

Canary pox, "schnappkrankeit," was reported to be prevented by a modified virus vaccine, but not without vaccinational losses.

Surgical Innovations

Advances in the field of anesthesia include the intrapelvic pudendal nerve block to anesthetize the penis of bulls and stallions. Surital sodium given intraperitoneally proved popular as a small animal anesthetic because of its handy packaging, its quick, smooth effect, and its safety. It also worked well in swine, given intraperitoneally or intravenously. Intratracheal or "tubal" anesthesia was being used in small animal practice, and on at least one pony, using ether or other inhalant anesthetics with a respiratory apparatus. This method made possible new advances in intrathoracic and even intracardial surgery. Other small animal surgical developments include the use of plastic or stainless steel prosthesis for the head of the femur, and a method of substituting a band of fascia for the round ligament to prevent recurrent dislocation of the hip joint.

The use of a variety of proteolytic enzymes to induce the fission and liquefaction of purulent exudates in abscesses, sinuses, or other body cavities is proving of practical value.

Other Advances

Atrophic pancreatitis was recognized in dogs with increasing frequency. It was diagnosed by measuring the animal's inability to assimilate vitamin A.

The possibility that "green" phenothiazine may contain impurities which affect the thyroid gland was suggested. They may cause an increase in the animal's gain in weight yet interfere with its reproduction.

Many other advances in veterinary science have occurred in recent months but those mentioned above should indicate that the veterinary profession is constantly improving its service to mankind. With due humility, may that continue ever to be our goal.

1954 Livestock Estimates

We are annually indebted to the American Feed Manufacturers Association for estimates of the various species of farm animals to be raised in the following year.

For 1954, increases are anticipated for all classes of livestock and poultry except horses and mules. The estimated equine reduction of 7 per cent would be less than in recent years. Beef cattle are expected to show a continued increase of about 3 per cent in spite of liquidations in the drought belt of the Southwest and the disparity between cattle and feed prices. An increase of less than 2 per cent is expected in dairy cattle. Milk production, because of better quality of roughage, may increase slightly.

A spring pig crop of nearly 55 million, an 8 per cent increase, is expected. The 1953 fall pig crop was estimated at 34.5 million, 2.5 per cent less than in 1952. The average slaughter weight is expected to be the same as last year—235 lb.

Total sheep numbers may increase 3 per cent, partly due to a shift from cattle to sheep in some drought areas.

Poultry production, including turkeys, is expected to increase. Laying hens should average 350 million, a 3 per cent increase.

Total feed supplies are moderately large but not well distributed due to the drought. Grains, corn in particular, are relatively more plentiful than high protein feeds.

CURRENT LITERATURE

ABSTRACTS

Chlortetracycline in Anaplasmosis

Six cattle infected with anaplasmosis were treated with 15.0 Gm., 25.0 Gm., 37.5 Gm., 60.0 Gm., and 2 with 100.0 Gm. of chlortetracycline (aureomycin). Those receiving 60 and 100 Gm. were treated in two equal doses approximately one month apart. One cow receiving 100 Gm. of the drug failed to transmit anaplasmosis for 296 days following treatment when subinoculations were made using 5 ml. of inoculum. The 2 cattle receiving less than 30 Gm. of aureomycin transmitted anaplasmosis with 3 to 5 ml. of inoculum on subinoculation at all times tested, while the remaining 3 receiving 30 Gm. or more of aureomycin, showed a period of from sixteen to forty-six days following treatment during which time anaplasmosis was not transmitted by subinoculation of 3 to 5 ml. of inoculum. After this period, transmission was regularly accomplished. Two theoretical explanations are given for this phenomenon.—[*W. E. Brock, C. C. Pearson, and I. O. Kliewer: High Level Chlortetracycline (Aureomycin) Dosage in Anaplasmosis. Am. J. Vet. Res., 14, (Oct., 1953): 510-513.*]

Physiological Changes in the Mammalian Pineal Gland

This paper contains a critical review of the literature regarding the endocrine function of the pineal gland, followed by a study of 153 pineal glands from sheep, 110 from cattle, and 755 from rats, in an attempt to correlate physiological changes in the gland with the reproductive system. The mean pineal gland weights for various age groups are reported for pregnant and nonpregnant ewes, rams, and castrated male sheep; calves, nonpregnant cows, bulls, and steers; and adult and immature white rats.

In nonpregnant ewes, the largest pineal glands were found in those individuals exhibiting well-developed ovarian follicles. The mean pineal gland weight in castrated male sheep is less than in the ram. The mean pineal gland weight in pregnant ewes is greater than in nonpregnant ewes. The pineal gland appears to be larger in the dairy cow than in the beef cow. Castration causes the pineal gland of the steer to weight less than the gland in the bull of similar age. The pineal gland in the male is heavier than in the female. This fact may be related to the physiological state of the reproductive system. The authors believe this difference may be explained by the fact that in males there is more or less permanent sexual activity, whereas females exhibit rhythmic sexual cycles which may be reflected in the pineal gland.—[*Enrique Santamarina and W. G. Venzke: Physiological Changes in the Mammalian Pineal Gland Correlated with the Reproductive System. Am. J. Vet. Res., 14, (Oct., 1953): 555-562.*]

Estrogens and Testosterone of Bull Semen

Two different samples of bull semen were investigated qualitatively for the presence of estrogens and testosterone. The bioassay of estrogens using two different methods: (1) increase in uterus weight of immature, treated albino rats and (2) detection of cornified epithelium in vaginal smears of mature, spayed, treated, albino rats, gave negative results. The bioassay of testosterone (based on the increase in weight, and epithelial response, the seminal vesicles of mature, castrated, treated, albino rats) gave positive results.

It is concluded that while the absence of estrogens is probably a normal occurrence in bull semen, the presence of testosterone may play some role in the physiology of reproduction.—[*G. O. Puntriano: Qualitative Investigation of Estrogens and Testosterone of Bull Semen. Am. J. Vet. Res., 14, (Oct., 1953): 542-547.*]

Behavior of Transmissible Lymphoid Tumor in Tissues of Chickens

The progressive development at the site of implantation, the later evolution, and the terminal spread of a malignant lymphoid tumor (RPL No. 16) in chickens showed striking uniformity in birds inbred for both resistance and susceptibility to the spontaneous disease, lymphomatosis. Metastatic tumor cells were seen in the visceral organs of both resistant and susceptible lines. The tumor spread was apparently associated with necrosis of the blood vessels and subsequent entrance of tumor cells into the circulation. Once in the circulation, there was a rapid accumulation of tumor cells in the liver sinusoids, kidney, and proventriculus, causing hemorrhage and necrosis, and leading to death a day or two later. There was no indication that the general lymphoid tissues of the body became neoplastic. There was a systemic proliferative response similar to that seen in certain other infectious diseases of the fowl. This response was most marked in the resistant birds. The results of the experiment indicate that the cellular implant has the ability to overcome inherited resistance to naturally occurring lymphomatosis. The tumor specimen used in the experiment had been frozen at solid CO_2 temperature for sixteen months prior to use. Upon inoculation into the breast muscle of week-old chicks, tumors arose at the site of the

implant within two weeks. Since the latent period of fowl lymphomatosis following injection of the filterable agent is more than three months, it is concluded that the tumor cells from the frozen sample were viable.—[*W. H. Eyestone: The Behavior of a Transmissible Lymphoid Tumor in the Tissues of Chickens Inbred for Resistance and Susceptibility to Spontaneous Lymphomatosis. Am. J. Vet. Res., 14, (Oct., 1953): 594-600.*]

Evaluation of Immunity from Newcastle Disease Vaccine

The method used to measure the immunity was to challenge chickens by intranasal inoculation and to determine the presence or absence of virus in the blood, spleen, or lung seventy-two or ninety-six hours later. Failure to isolate virus from the tissues was considered evidence of immunity.

Preliminary experiments were carried out to evaluate the immunity in five groups of chickens following the use of formalin-inactivated Newcastle disease vaccine. The study revealed that a single dose of vaccine given to 3-month-old chickens induced a partial immunity. A second dose of vaccine given two weeks after the first injection did not definitely enhance the immunity. However, two doses given three months apart did result in a substantial degree of immunity which lasted at least eight months after the last dose of vaccine. —[*M. S. Hofstad: A Method of Evaluating Immunity Following Vaccination of Chickens with Inactivated Newcastle Disease Vaccine. Am. J. Vet. Res., 14, (Oct., 1953): 590-593.*]

Immunization of Chickens Against Newcastle Disease

Six groups of 60 chickens each were used to determine the immunizing effect of two doses of inactivated Newcastle disease vaccine given at different intervals. The initial dose of vaccine was given when the chicks were 3 weeks of age and the second dose was given at intervals of 2, 5, 9, 13, and 17 weeks. One group served as once-vaccinated controls. Each group, along with unvaccinated controls, was challenged with virulent virus four months after the second dose of vaccine. An increased resistance to challenge was demonstrated with the increasing intervals between doses of vaccine. The data indicate that an interval of at least nine weeks, and preferably longer, should be allowed between doses of alumina-gel, formalin-inactivated Newcastle disease vaccine to obtain a substantial degree of immunity.—[*M. S. Hofstad: Immunization of Chickens Against Newcastle Disease by Formalin-Inactivated Vaccine. Am. J. Vet. Res., 14, (Oct., 1953): 586-589.*]

Avian Spirochetosis in Turkeys

A brief historical review of this disease, specifically of the investigations in the United States, is given. Descriptions of three outbreaks, citing the unknowns of this disease in California are reviewed. *Argas persicus* were collected only from the premises of the third outbreak and tick transmission trials for the recovery of the causative agent, *Borrelia anserina,* were attempted by: feeding, intramuscular inoculation of triturated ticks, and esophageal introduction of whole ticks. Experimental birds included chickens and turkeys. From over 600 ticks tested, all birds were negative for spirochetosis, as were smears for spirochetes made from triturated ticks. The possibility of the involvement of another vector was not investigated but a brief review is given of previous research to incriminate other ticks, mites, and mosquitoes. The negative results, coupled with discoveries made by the investigators of the previous two outbreaks, suggest that infective bile droppings of turkeys represent the most probable means of transmission of avian spirochetosis in the reported California outbreaks.—[*E. C. Loomis: Avian Spirochetosis in California Turkeys. Am. J. Vet. Res., 14, (Oct., 1953): 612-615.*]

FOREIGN ABSTRACTS

Therapy for a Ruptured Uterus

The author describes 4 cases of uterine rupture in cows. Prolapse of the uteri was accomplished by traction on those cotyledons farthest forward in the gravid uterine horn. In 1 case, the uterus was then amputated. In 3 cases, the rupture wound was sutured and the uterus was replaced in its normal position in the usual way. Infection of the peritoneal cavity was avoided by administering penicillin powder, or streptomycin powder, through the wound before it was sutured. The animals were then treated with a sulfonamide intravenously for several days. All animals recovered completely. Most remarkable was the normal temperature during nearly the whole process of recovery.—[*W. Meyers. Therapy for a Ruptured Uterus. Tijdschrift. voor Diergeneesk., 78. (May 15, 1953): 439-445.*]—L.V.E.

A Bull with a Ring-Torn Nose

A bull had torn its nose ring out completely. The bull was anesthetized and the wound sutured with heavy silk. After eight days, the wound having healed, the sutures were removed. Six weeks later, a new ring was applied. The scar was almost invisible.—[*G. Grootenhuis. A Bull with a Ring Torn Nose. Tijdschrift. voor Diergeneesk., 78, (May 1, 1953): 398-399.*]—L.V.E.

Mammary Inflation in Human Eclampsia

The author, a veterinary practitioner, interested a physician in the similarity of milk fever in bovine and human eclampsia. He states that both appear at the onset of lactation and in fatal cases the postmortem findings are identical. It was then decided to try the Schmidt-Evers treatment in cases of eclampsia not responding to any of the accepted treatments. Mammary inflation was per-

formed only when death appeared imminent and with the consent of the next of kin. The first case was treated in 1928 and since then 12 patients have been treated, with only 1 fatality, and that was due to uremic poisoning.

A complete case history is given of a primiparous woman with eclampsia in which the only instruments at hand were a lumbar puncture needle and a common bicycle pump. Response to insufflation with filtered air was prompt. The author concludes that this is the first reported case history of the successful application of the Schmidt-Evers treatment in an otherwise fatal case of human eclampsia.—[*R. Amiot: Le Traitement de Schmidt-Evers dans la Fievre Vitulaire et l'Eclampsie Humaine. Bull. Acad. vet. France, (Feb., 1953): 141-144*]—R.F.V.

Influence of Penicillin and Streptomycin in Diluted Semen

The conception rate for semen to which penicillin and streptomycin had been added was not higher than for semen to which these antibiotics had not been added. In only 1, a bull with low fertility, was the conception rate increased.—[*S. W. J. Van Dietem, J. Hendrikse, and K. F. Joling. The Influence of Penicillin and Streptomycin in Diluted Semen. Tijdschrift. voor Diergeneesk., 78, (May 15, 1953): 419-438.*]—L.V.E.

Septicemia in Newborn Puppies

The author claims that while septicemia of the newborn among the large animals has received considerable attention and the etiology is fairly well understood, septicemia of young puppies has received little study. During his fifteen years of study, he submitted puppies dead of septicemia to the National Research Laboratories, Bacteriological Institute of Tours, and the Serotherapy Institute of Toulouse. The organisms isolated were *Escheria coli,* Salmonella spp., Pasteurella spp., and streptococci. The symptomology is described thus: after a normal gestation, the bitch gives natural birth to an apparently normal litter. The puppies take to breast feeding energetically. Then they stop nursing and become prostrate and are found dead four or five hours later. The first death is usually in twenty-four to forty-eight hours, then in four to five days the entire litter has succumbed. Most breeders are inclined to blame the bitch as a poor mother, or for not producing sufficient milk to feed the litter. In America, the condition has been referred to as "acid milk" and the prenatal ration has been blamed.

The author tried three different treatments and lists a fourth which he feels may have some value. He first used streptococcic antiserum, believing that streptococcic septicemia was responsible, but he had very little success. He then tried autogenous Salmonella vaccine in both the pregnant bitches and the newborn puppies. The results were not uniform. He states that the vaccination of newborn puppies does not result in immunity as their reticuloendothelial system is not responsive. His third and most successful treatment was polyvalent serum containing antibodies against all four pathogens recovered from the dead puppies. He suggests that aureomycin may be of some value in the control of this serious affliction of young puppies.—[*M. Pigot: Contribution in the Study of the Mortality of New-Born Puppies. Bull. Acad. vet. France, (March, 1952): 97-103.*]—R.F.V.

Prevention of Verminous Diseases in the Horse

Attention is called to the extensive spread of worm infections in horses, especially Strongyloides spp. and Ascaris spp. Emphasis is laid on prevention but therapeutic treatment is also necessary. Preventive measures are accentuated because after heavy infestation it will only be possible to remove the parasites from the intestinal tract and this does not repair damage already done elsewhere, or hinder the course of development of the larvae. Many of these will still be in the stage of "migration."

It is considered important for all the horses to be given a parasiticide in the spring before the animals go to pasture. At that time, nearly all the larvae have moved into the intestinal tract where they can then be removed with success. By application of these measures, which are described in detail, it is possible to raise foals with a minimum of worms. Complete freedom is not possible under the ordinary circumstances; therefore, it is always important to give the foals therapeutic treatment aimed at both ascarids and Strongyloides organisms. The use of carbon disulfide and phenothiazine, respectively, are advised.—[*G. Grostenhuis: The Prevention of Verminous Diseases in the Horse. Tijdschr. voor Diergeneesk., 78, (Aug. 1, 1953): 630-635.*]—L.V.E.

Coligranulomata in Chickens

A report is submitted on 8 cases of coligranuloma in hens coming from eight farms in one province. Out of 1,000 necropsies on hens, in the laboratory of the Animal Health Service, both avian tuberculosis and coligranuloma were found in less than 1 per cent of the examined birds. Macroscopically and microscopically, this granuloma can be distinguished from avian tuberculosis only with great difficulty. The disease in 2 of 3 cases was caused by mucus-forming microörganisms, so-called "mucoid-colibacteria." In the other 5 cases, the birds also had chronic coccidiosis. The examination for avian tubercle bacilli was always negative. The disease caused little economic damage, its importance being that, without further examination, the diagnosis of tuberculosis would be made unjustly.—[*F. W. Van Ulsen. Coligranulomata in Chickens. Tijdschrift. voor Diergeneesk., 78, (May 1, 1953): 393-397.*]—L.V.E.

BOOKS AND REPORTS

Ancient Veterinary History

In this book, Froehner has collected and correlated all the information known about veterinary medicine in antiquity, from the veterinary papyrus of Kahum, written about four thousand years ago, to the fall of the Roman Empire. He has scrutinized the various veterinary inscriptions and treatises of the ancient civilizations in Egypt, Carthage, Asia Minor, Persia, India, China, Japan, Greece, and Italy. Perhaps the writings of the numerous Greek and Roman veterinarians, living from the first to the fifth century, form the most valuable source of our knowledge of the organization of veterinary medicine in antiquity. We learn to know veterinarians employed in private practice, on stud farms, in the circus, in military service, and in the postal service of the Roman Empire, and we become acquainted with the use of their instruments and with other interesting data. Thus, the author gives us a glimpse of the beginnings of veterinary medicine as one would catch a glimpse of a streamlet, meandering through a meadow, viewed from a vantage point where one can see the direction of the stream, but only brief stretches of it are visible.

The book contains 34 illustrations, many quotations from the original manuscripts, footnotes, and an index. It is a rich mine of information about the lore of our profession in bygone days, not otherwise readily accessible, but well worth delving into. Succeeding volumes will deal with the veterinary history of Germany and other countries, including the United States.—[*Kulturgeschichte der Tierheilkunde. I. Band: Tierkrankheiten, Heilbestrebungen, Tierarzte im Altertum (History of Veterinary Progress. Vol. 1: Animal Diseases—Attempts at Therapeutic Efforts—Veterinarians in Antiquity). By Dr. Reinhard Froehner. 187 pages. Terra Verlag, Konstanz, Germany. 1952. Price approximately* $5.]—F. VOLKMAR.

Portraitures of Horses

This volume is a compendium of the work of America's most famous horse artist, George Ford Morris. It contains what might be termed a pictorial history of the prominent American breeds, for Mr. Morris has been painting the champions of the Thoroughbred, Standardbred, American Saddle, Draft, Hackney, and other breeds for over sixty-five years.

In the book are reproduced more than 700 of the artist's works in nearly every medium, including sculpture. Twenty of the illustrations are in full color: Man O' War, Greyhound, Wing Commander, Justin Morgan, Rex McDonald, and the Darley Arabian gallop to life on the book's pages. There are also portraits of a pair of brilliantly hued fightings cocks, as well as outstanding beef and dairy cattle, cats and dogs, and a few people.

While the superb artistry of the reproduced works holds the eye, the autobiographical notes which accompany the pictures should not be overlooked, since Mr. Morris' prose is fully as fascinating as his paintings. The story of his boyhood (cutting out silhouettes of animals at an early Chicago livestock show won him his first illustrating job on an early horse review when he was only 16), and the anecdotes which he relates about the equine greats depicted in the volume—and their owners—make for many a pleasurable hour of reading.

If the price seems high ($35), it is only because Mr. Morris wished to produce no mediocre work, but literally the "horse book of the century." In accomplishing what others have failed even to attempt, Morris has successfully met his challenge and left for us a splendid tribute to a great part of our heritage.—[*Portraitures of Horses. By George Ford Morris. 280 pages. 700 illustrations (20 in color). Fordacre Studios, Shrewsbury, N. J. 1952. Price* $35.]—ROBERT M. HENSLEY.

How to Raise a Dog

The original publication of this book appeared in 1938 and was well received. The second edition has been revised to include the modern treatment of disease, the use of antibiotics, and a modern concept of training and disciplining the dog. The book is written in an interesting journalistic style and is easy reading. The place to buy, how to buy, and the precautions of buying a puppy are thoroughly discussed and illustrated in the early pages. If prospective dog owners would follow its advice, owning a dog would be an enjoyable experience.

If the book were to be criticized, it would probably be in the chapter on feeding recommendations. Kennel owners, dealers in dogs, and writers on dog subjects tend to prescribe complicated feeding menus and instructions. The new dog owner has had little experience with dogs and the feeding problem often falls on an already overworked mother who has three or four children to feed. This mother has little time or appreciation for long, complicated formulas when this chore is added to the regular duty of feeding her family. There are many reliable, prepared dog foods available that can be prescribed that will lighten the load of the mother of the home, as well as save on her budget. There is little objection to the character of the diets recommended; the objection is only to the length and complication of the diets.

Owners and prospective owners of dogs are constantly asking for reliable information concerning various problems. This book helps to fill this need and should be appreciated by those people wanting to learn more about dogs.—[*How to Raise a Dog. By James R. Kinney and Ann Honeycutt. 199 pages. Illustrated. Simon and Schuster, 630 Fifth Avenue, Rockefeller Center, New York 20, N. Y. 1953. Price* $2.95]—W. H. RISER.

The U. S. Department of Agriculture's 1953 yearbook, "Plant Diseases," is now available from members of Congress. It contains 1,000 pages and sells for $2.50.

THE NEWS

AVMA to Seattle in 1954

Ninety-First Annual Meeting to Be Held Aug. 23-26, 1954

Local Committee on Arrangements Selected — Housing Bureau Will Handle Hotel Reservations

Seattle, Wash., will be the host city for the 1954 annual AVMA convention—the first time that this Pacific Coast metropolis has so served. It will also be the first time that the Association has convened in the Pacific Northwest since 1925, when the meeting was held in Portland, Ore.

August dates were selected by the Executive Board, having in mind the vacation-time appeal which a trip to Seattle offers. For those who wish to drive, or go by train or plane, the routes offer the utmost in scenic attractions both going and returning; also for those who may wish to make pre- or postconvention excursions to Alaska, the Hawaiian Islands, the Canadian Rockies, or to one or more of the great national parks in the Far West, Seattle is an especially advantageous point of departure and return.

LOCAL COMMITTEE ORGANIZED

The officers and chairmen of the Committee on Local Arrangements were recently selected and held an organization meeting on November 17, which was attended by Executive Secretary Hardenbergh and Assistant Executive Secretary Kingman of the Chicago office. The committee comprises:

Committee on Local Arrangements

General Chairman.—Dr. E. E. Wegner, Seattle.
Vice-Chairman.—Dr. P. M. Hinze, Carnation.
Secretary.—Dr. D. W. Clarke, Seattle.

Part of the Seattle skyline, with Lake Washington in the foreground.

Chairman-Executive Committee.—Dr. J. C. Kraft, Seattle.

CHAIRMEN

Registration and Information.—Dr. G. W. McNutt, Seattle.

Reception and Hospitality.—Dr. C. R. Griffith, Seattle.

Meeting Rooms and Equipment.—Dr. Floyd Dixon, Renton.

Exhibits.—Dr. Howard E. Bean, Seattle.

Entertainment and Golf.—Dr. P. S. Millard, Everett.

Alumni Dinners.—Dr. O. A. Anderson, Seattle.

Publicity and Public Relations.—Dr. F. C. Cummings, Seattle.

Television.—Dr. R. H. Fuller, Seattle.

Hotels and Housing.—Dr. R. B. Watkins, Redmond.

Garages and Airports.—Dr. W. H. Gustafson, Seattle.

Women's Activities.—Mrs. Don W. Clarke, Seattle, and Mrs. Robert T. Phelps, Vancouver, *Co-Chairwomen.*

A number of convention plans were formulated at this first meeting.

HOUSING BUREAU TO HANDLE HOTEL RESERVATIONS

Arrangements have been made with the Seattle Hotel Association to operate a housing bureau in coöperation with the local committee. This bureau will receive all reservation requests, process them, and send out confirmations. A special form for reservations in Seattle hotels will be published each month in the JOURNAL, starting with the February issue.

Because Seattle has a large summer influx of vacationers and tourists, it will be necessary to use a number of hotels to house AVMA members and their families, in addition to the Olympic Hotel which will be the principal headquarters. The hotel information to be published will include, in addition to the reservation form, a complete list of hotels which have allotted blocs of rooms for the convention, their rates, and a street map showing their locations.

Members and others who have sent in advance requests for accommodations at the Olympic have been notified that their applications would be processed after the housing bureau is in operation.

AVMA TO OFFER SPECIAL CONVENTION TOURS

The Executive Board has authorized the central office to make arrangements with Happiness Tours, Inc., of Chicago, for special tours in connection with the Seattle meeting. Full details will be announced later but it is expected that only one going route to Seattle will be offered, with stops at some of the national parks and monuments. Following the convention, a choice of return routes will be available, also extension tours to Alaska, Hawaii, and other places of interest, as previously mentioned.

Happiness Tours handled the very successful trips in connection with the San Francisco meeting in 1948, the Miami Beach convention in 1950, with the Havana extension, and has also served smaller AVMA groups at other meetings. It is planned to mail a special announcement to members early in the spring, which will give complete details of the Seattle tours.

SEATTLE SUMMER CLIMATE IS COMFORTABLE

Although some AVMA conventions in the past seem to have carried with them a special brand of weather regardless of location, it is safe to predict that Seattle in August will be comfortable, with moderate temperatures in the daytime and cool nights. Its location on Puget Sound and 26-mile-long Lake Washington provides good "air conditioning."

Watch the JOURNAL for further information and details about the Ninety-First Annual Meeting.

Resolutions Adopted by Fifteenth International Veterinary Congress

Following is a condensed version of the resolutions adopted by the Fifteenth International Veterinary Congress which was held in Stockholm, Sweden, Aug. 9-15, 1953:

I. FIGHT AGAINST EPIZOOTICS ON INTERNATIONAL LEVEL

Recognizing the need for energetic campaigns against epizoötics and international coördination of them, also the overlapping of such activities by member states, with consequent high costs and impaired efficiency, the Congress believes that international efforts should be organized largely through the O.I.E. (Office of International Epizoötics) and F.A.O. (Food and Agriculture Organization of the United Nations).

II. REVISION OF STATUTES AND BY-LAWS OF THE I.V.C.

The Permanent Committee of the Congress is instructed to draft a revision of the permanent statutes of the Committee and of the By-Laws in 1957; also to consider if a "World Federation" of veterinarians is desirable.

III. INTERNATIONAL STANDARDIZATION OF BIOLOGICAL PRODUCTS

Recognizing the need for international standards for veterinary biological products, the Committee on Biological Standardization of W.H.O. (World Health Organization) is urged to extend its work to certain veterinary products, especially Clostridium welchii (Cl. perfringens) antigens and swine erysipelas serum; the O.I.E. is also encouraged to continue its studies of biological products for use in controlling animal diseases.

IV. POSTGRADUATE SCHOLARSHIPS IN VETERINARY PARASITOLOGY

In view of the heavy losses in livestock from parasites, and the scarcity of trained parasitologists, the coöperation of O.I.E. and F.A.O., also of national and international veterinary bodies, is sought to establish suitable postgraduate scholarships in veterinary parasitology.

V. PREVENTION, TREATMENT, AND CONTROL OF PARASITIC DISEASES

The coöperation of O.I.E. and F.A.O. and other agencies is urged to determine the distribution of important para-

sitic diseases of livestock to make available to veterinarians the latest and most authentic information on their prevention and treatment, and to encourage the practical control of parasitic diseases throughout the world.

VI. EARLY DISTRIBUTION OF CONGRESS PAPERS TO DELEGATES

The Organizing Committee of the next Congress is urged to see that reports of papers to be presented at that Congress are in the hands of delegates a least one month before the Congress convenes, if possible.

VII. VETERINARY EDUCATION ON THE PHYSIOLOGY AND PATHOLOGY OF REPRODUCTION AND LACTATION

Because prevention and treatment of disturbances in reproduction and lactation, also artificial insemination of domestic animals, have developed into especially important branches of veterinary science and practice, veterinary schools are urged to insure adequate instruction of students in these subjects.

VIII. INTERNATIONAL ANIMAL PRODUCTION ORGANIZATION

Realizing the vital contribution which the veterinary profession can make to animal production, the formation of a special animal production organization is recommended to deal with animal breeding, nutrition, and husbandry in relation to animal health and productivity. This organization should be affiliated with the I.V.C. and be represented on the Permanent Committee.

IX. INTERNATIONAL EXCHANGE OF VETERINARIANS

It is proposed that veterinary organizations of the various countries organize an exchange of veterinarians in different fields of activity for the purposes of study, gaining practical experience, and establishing personal contacts.

X. USE OF VACCINES AGAINST INFECTIOUS DISEASES AND EPIZOOTICS

It is recommended that, when choosing a method of immunization to combat an infectious disease, preference be given to vaccines composed of germs or viruses killed or made inactive, so that they are totally inoffensive (harmless). Living germs or viruses, attenuated or not, should not be used unless no other method of sufficient value exists.

In that case, the so-called "living" vaccines should not be used generally unless a profound experimental study has proved the stable character of the viruses in the vaccine, and has precisely determined the risks their use involves. The possession and use of these vaccines should be reserved exclusively to veterinarians.

XI. FOOD HYGIENE AND PUBLIC HEALTH

1) Realizing the importance of veterinary work for public health and public economy, the increased participation of veterinarians in public health and agricultural administrations is recommended, especially for combating zoönoses, for supervision of foods, and for the study of other questions of current interest to human and animal health.

2) Since the value and effect of such food supervision depends on the technical training of the supervising veterinarians, it is desirable that special training of veterinarians in the manufacture and supervision of foods of animal origin be given in all countries.

3) As an important part of food poisoning is caused by permanent human excreters of Salmonella-bacteria, suitable measures for the removal of germ carriers from the food trade should be aimed at in all countries.

4) W.H.O., F.A.O., O.I.E., and other international organizations should render technical and consultative services to individual countries in the field of zoönoses and, through the development of international standards of research in zoönoses and food hygiene, facilitate the training of veterinarians for public health service.

XII. CONTROL OF RABIES

It is recommended that international organizations such as W.H.O., F.A.O., and O.I.E. provide material and technical assistance to countries where rabies is enzoötic, in an intensified effort to control and eradicate the disease by well proved sanitary measures combined with mass immunization of dogs with a vaccine of proved potency, reinforced, where necessary, by wildlife-reduction programs.

Nominations for 1954 Humane Act Award Should Be Submitted

Veterinarians and students in veterinary medicine throughout North America are being asked to submit nominations for the AVMA Humane Act Award which is given annually to a boy or girl, not over 18 years old, who has performed an outstanding act of kindness to animals.

Deeds on behalf of dogs and cats have predominated in the winning column since the start of the award in 1944, but the committee in charge of the project emphasizes that kindness to livestock and wild animals is just as acceptable in determining the winner.

Nominations should be sent not later than April 1, 1954, to the American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill.

The winner will be announced at the AVMA national convention in Seattle, Wash., Aug. 23-26, 1953. The award consists of a framed certificate describing the act of kindness and a $100 U. S. savings bond.

Last year's winner was a boy who rescued a dog trapped in a 300-ft. deep canyon. Among other winners in the past have been a boy who built a bumper device to protect a blind dog that had been his childhood pet, a girl who captured a rabid dog, and a boy who rescued some valuable show horses from a burning barn.

American Board of Veterinary Public Health Offers Award for Thesis

The American Board of Veterinary Public Health is offering a $100 U. S. Government bond to the senior veterinary student who develops the best thesis on the subject of "Veterinary Public Health," as determined by the faculty of the College. The thesis should not exceed 1,500 words.

The best thesis from each veterinary college will be submitted to the governing council of the American Board of Veterinary Public Health, which will make the final decision as to the winner. All these must be in the hands of the secretary-treasurer no later than July 1, 1954. Competition is limited to the veterinary colleges located in the continental United States. —*M. D. Baum, 2601 Locust St., Denver 7, Colo., secretary-treasurer.*

Honorary Fellowships Awarded in American Board of Veterinary Public Health

At the Fifteenth International Veterinary Congress recently held in Stockholm, Sweden, honorary fellowships in the American Board of Veterinary Public Health were awarded to Dr.

(*Continued on page 76*)

News From Washington

March 1954 Veterinary Recall.—The Army has announced plans with regard to calling 34 V.C.-U.S. Army Reserve officers to active duty during the month of March, 1954. This is the number required to replace Reserve officers presently on active duty, whose terms of obligatory service will end in early spring.

It had been hoped that replacement requirements would be met entirely through volunteers, but a sufficient number had not materialized by the latest date on which it was possible to initiate action for a March, 1954, recall program.

A Reserve recall program, rather than a Selective Service call under the Doctor Draft Act (which would result in a call **limited** to Priority I special registrants), was instituted in order to make possible the acceptance of young veterinarians classified in Priority III and who are now being offered Reserve commissions in lieu of induction under the regular draft. Those entering on active duty from this group will reduce the number (34) to be recalled in March, 1954, proportionately. It is entirely possible that this will result in making it unnecessary to recall anyone involuntarily. In other words, Army commanders will be authorized to apply those veterinarians who agree to accept Reserve commissions and volunteer for active duty, in lieu of induction as regular draftees, against quotas assigned to them for the March, 1954, recall program.

If a Selective Service call had been issued to obtain replacements, it would not have been possible under existing regulations to apply volunteers against the call and also would have denied the young veterinarian liable under the regular draft an opportunity to serve in a commissioned status.

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The second session of the 83rd Congress will convene Jan. 4, 1954. Congressional hearings will be held on matters directly affecting members of our profession. As is always the case, members of committees will be more impressed by testimony that represents an organizations' membership reaction rather than that presented in behalf of a board. Comments from constituent associations or members related to specific legislation are always appreciated by your AVMA representative in Washington.

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Secretary of Defense Wilson at a recent press conference said military scholarships should be withheld from veterinarians because "the horses are all gone out of the service." The Washington AVMA office and the Executive Board of the AVMA are taking immediate steps to correct Secretary Wilson's lack of appreciation of what modern veterinary medicine encompasses.

The military history of World Wars I and II alone is evidence of the importance of a well-organized veterinary service to safeguard the health of United States military personnel in all parts of the world.

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Dr. Frank B. Berry, professor of clinical surgery, College of Physicians and Surgeons, Columbia University, New York City, has accepted the position of **assistant secretary of defense** (Health and Medical Affairs). He will succeed Dr. Melvin A. Casberg who was appointed to that new position on April 1, 1953. When Dr. Casberg accepted, it was with the understanding that he desired to be relieved in January, 1954, to return to private practice.

Dr. Berry is a veteran of World War II, serving as surgical consultant, Seventh Army, in the European Theater. He was appointed a brigadier general, Medical Corps Reserve, on March 11, 1949.

AVMA Office Address in Washington

Brig. General James A. McCallam (Ret.)
Room 109, 1507 M Street, N.W.
Washington 5, D. C.

(Continued from page 74)

Jean Verge of the Alfort Veterinary College, and Dr. Karl F. Meyer of the George Williams Hooper Foundation, San Francisco, Calif. Both of these awards were made for outstanding contributions in the field of veterinary public health, and the elevation of the standards of this specialty.

At the AVMA meeting in Toronto, the Board elected Brigadier General Wayne O. Kester to honorary fellowship, in recognition of his continuing efforts in behalf of veterinary public health and the promotion of this specialty among the personnel in his command by encouraging graduate training and other means.—*M. D. Baum, D.V.M., Denver, Colo.*

Women's Veterinary Medical Association

A recent survey conducted by the Women's Veterinary Medical Association showed that there are 200 graduate women veterinarians in the United States and Canada. Contrary to general belief, the majority (80 per cent) are now actively engaged in the various branches of veterinary medicine, including research, teaching, public health, poultry inspection, U. S. BAI, zoo work, commercial drug production, and in private practice.

The following are officers of the Association: Drs. Lois Calhoun, Michigan State College, East Lansing, president and treasurer; Patricia O'Connor, Staten Island, N. Y., secretary; Lorraine Beaman Nielsen, Guelph Ont., eastern vice-president; Norma Greiner Kopp, Grand Rapids, Mich., central vice-president; Phyllis Hickney Larsen, San Diego, Calif., western vice-president; and Hildegard Seelig, Asheville, N. Car., southern vice-president.

STUDENT CHAPTER ACTIVITIES

Student Chapter Officers.—The officers and faculty advisors for student chapters of the respective schools of veterinary medicine for the fall term are as follows:

ALABAMA POLYTECHNIC INSTITUTE, Auburn, Ala.

Luther L. Albert, president; Jack McElyea, president-elect; Roy Monroe, vice-president; Jack L. Nunnery, secretary; John L. Jernigan, treasurer; Dr. H. R. Seibold, faculty advisor.

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UNIVERSITY OF CALIFORNIA, Davis, Calif.

L. M. Proctor, president; R. L. Brewer, president-elect; Gene Tobias, vice-president; William Bayliss, secretary; Joe Held, treasurer; Dr. Jack Howarth, faculty advisor.

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COLORADO A. & M. COLLEGE, Fort Collins, Colo.

Gene Bierhaus, president; Hugh Leslie, vice-president; Gordon Solomon, secretary; Stuart Lovelace, treasurer; Tom Orchard, social chairman; Van Sandstedt, athletic manager; Tom Gray, student council representative; Tom Orchard, student council representative; Dr. Kieth Wayt, faculty advisor.

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CORNELL UNIVERSITY, Ithaca, N. Y.

Robert F. Kahrs, president; Helen V. Coates, vice-president; Henri C. Marsh, secretary; John A. Matochek, treasurer; Drs. John Bentinck-Smith and Robert Kirk, faculty advisors.

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UNIVERSITY OF GEORGIA, Athens, Ga.

Roy R. Smith, president; Lem B. Staton, president-elect; William B. Clark, vice-president; Stephen C. Hite, treasurer; Earl Staton, recording secretary; J. Edward Brown, corresponding secretary; Drs. Donald D. Cooperrider and Adrain M. Mills, faculty advisors.

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UNIVERSITY OF ILLINOIS, Urbana, Ill.

Thomas Folkerts, president; James Nadler, president-elect; Dean Schlapp, vice-president; Norman Jones, secretary; Stanley Larsen, treasurer; Dr. L. E. St. Clair, faculty advisor.

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IOWA STATE COLLEGE, Ames, Iowa.

Bob Nelson, president; Bill Thomas, president-elect; Bill Rugger, vice-president; Dennis J. Carr, secretary; Dick Collison, treasurer; Roderick Zackery, critic; Dr. D. L. Baker, faculty advisor.

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KANSAS STATE COLLEGE, Manhattan, Kan.

Rollin W. Vickery, president; Norman R. Meriweather, president-elect; Earl C. Wood, vice-president; Otto S. Shill, secretary; Walter Gier, treasurer; Drs. Marvin J. Twiehaus and Dennis J. Goetsch, faculty advisors.

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MICHIGAN STATE COLLEGE, East Lansing, Mich.

George McClarnon, president; Richard Lindsay, vice-president; Joseph Sewell, treasurer; Carol Beitzel, secretary; Dr. Ralph D. Barner, faculty advisor.

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UNIVERSITY OF MINNESOTA, St. Paul, Minn.

Albert Luedke, president; Kenneth Quist, president-elect; John Schlotthauer, vice-president; Gordon Kubesh, treasurer; Victor Perman, secretary; James Russell, sergeant-at-arms; Drs. Alvin Weber and John Arnold, faculty advisors.

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UNIVERSITY OF MISSOURI, Columbia, Mo.

W. A. Grieb, president; Venton Goodnight, president-elect; Harry Forrest, vice-president; James Bozarth, secretary; Lee Heutel, treasurer; Dr. Cecil Elder, faculty advisor.

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OHIO STATE UNIVERSITY, Columbus, Ohio.

Thomas W. Giglotti, president; Wayne C. Culbertson, president-elect; Stanley E. Peterson, vice-president; Joe W. Skaggs, secretary; Everett Fleming, Jr., treasurer; Dr. Harold F. Groves, faculty advisor.

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ONTARIO VETERINARY COLLEGE, Guelph, Ont.

R. E. Coleman, president; H. D. Branton, vice-president; H. C. Gibbs, secretary, D. M. Elliot, treasurer; Dr. J. A. Henderson, faculty advisor.

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OKLAHOMA A. & M. COLLEGE, Stillwater, Okla.

Kenneth Keakey, president; Ted Parker, president-elect; H. A. Justus, secretary; Jim Carpenter, treasurer; Drs. A. L. Malle and C. N. Murphy, faculty advisors.

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UNIVERSITY OF PENNSYLVANIA, Philadelphia, Pa.

James Z. Edelblut, president; Hugh W. Edmonds, president-elect; William Carr, treasurer; Bernard G. Levine, secretary; Dr. Donald Lee, faculty advisor.

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TEXAS A. & M. COLLEGE, College Station, Texas.

William H. Smith, Jr., president; James E. T. Laningham, president-elect; Clyde Odom, vice-president; Bill W. Henderson, secretary-treasurer; Rudolph A. Hoffman, parliamentarian; Paul T. Cardeilhac, sergeant-at-arms; Drs. H. E. Redmond and R. D. Turk, faculty advisors.

TUSKEGEE INSTITUTE, Tuskegee, Ala.

John White, president; Paul Taylor, president-elect; Ellis Hall, secretary; Allison McCottry, treasurer; Louis Singleton, reporter; Dr. G. W. Cooper, faculty advisor.

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WASHINGTON STATE COLLEGE, Pullman, Wash.

David D. Urie, president; George Stabenfeldt, vice-president; George Bell, secretary; John Harms, treasurer; Denny Bohkle, publicity chairman; Charles Schroeder, athletic chairman; Dr. R. E. Watts, faculty advisor.

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California Chapter.—The University of California Student Chapter of the AVMA is well into an educational and social program. A smoker, picnic, and fall formal have been successfully conducted and other events are scheduled throughout the semester. Several interesting speakers have addressed the group and several motion pictures have been shown.

On Jan. 24-26, 1954, the midwinter conference of the California Veterinary Medical Association will be held on the campus. It features such items as discussion groups, presentation of papers by visiting veterinarians, and demonstrations by the various departments within the School of Veterinary Medicine. Reception of the practitioners at this time is handled by the students, offering them a chance to get acquainted with possible future employers through a job placement service, also conducted by the students.

s/EDWARD L. ROBERTS, *Chairman, Publications Committee.*

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Iowa Chapter.—The Iowa State College Student Chapter of the AVMA held its annual fall banquet on October 20, with 215 in attendance. **Dr. James Hilton,** president of Iowa State College, was the principal speaker for the event. The program consisted of introductions of all staff members by **Dean Merchant,** and the presentation of the Borden Award to Mr. Harry Yoder, the senior who had achieved the highest grade average preceding the senior year.

Earlier, the Chapter had its annual homecoming picnic, which was attended by approximateby 400 veterinarians and their wives, from twelve states. Two students, James Francis and Glen Barrington, were co-chairmen of the event.

The annual Christmas party, held December 11 in the Memorial Union, was the concluding social activity of the year. The co-chairmen of this event were Clarence Ching and Keith Johnson. Jim Yoder served as master of ceremonies. The affair was attended by approximately 485 students, their dates, or wives and children. The program, with entertainment furnished by the junior class, was a big success.

s/HOWARD E. BAYLES, *Secretary.*

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Kansas Chapter.—The Kansas State College Student Chapter of the AVMA has adopted the policy of having two seniors speak at each meeting, reviewing the highlights of their summer employment with practicing veterinarians. The following have given highly interesting talks: **Earl Wood, Lloyd Orsborn, Winston Goering, Charles Swenson, Bill Herberg, J. A. Sprowls, Raymond Dill,** and **Joe Swanson.**

A smoker was held September 11 at which the freshmen were introduced to other Chapter members and to the faculty. **Dean Leasure** introduced Drs. Otto Eggers and John West who recently joined the faculty.

At the meeting on October 6, **Dr. R. H. Gump,** of Wichita, gave an interesting and enlightening talk on establishing a small animal practice. On October 20, **Dr. R. A. Bruce,** a general practitioner from Ottawa, gave helpful pointers on selecting a practice vehicle. At this meeting, Dean Leasure presented the Borden Award to Winston K. Goering. Runners-up for the award were Morris Morrisette and Otto Shill.

On November 17, **Dr. A. H. Quin,** president-elect of the AVMA, gave an interesting talk on veterinary ethics and public relations.

The highlight of the social calendar was the annual fall dance on November 20. Other social activities have included parties and picnics by each of the classes.

s/ALTON WILSON, *Secretary.*

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Missouri Chapter.—The University of Missouri Student Chapter of the AVMA met on November 9 to hear **Dr. Harry A. Herman,** executive secretary of the National Artificial Breeders Association, discuss the scope, problems, and place of the veterinarian in the inseminating program.

The annual Christmas dance was held at the Armory on December 12.

s/JAMES BOZARTH, *Secretary.*

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New York Chapter.—The New York State Veterinary College Student Chapter of the AVMA has begun the new year successfully, with approximately 90 per cent of the students as members and with good attendance at the meetings.

Dr. R. C. Klussendorf, director of veterinary research, Commercial Solvents Corp., Terre Haute, Ind., discussed the "Veterinarian of Tomorrow" at the October 13 meeting. On October 27, **Dr. Ellis P. Leonard,** director of the small animal clinic, presented a film and lecture on "Thoracic Surgery in the Dog," with particular emphasis on lung ventilation.

At the December 8 meeting, **Dr. J. H. Ripps,** practitioner from Asbury Park, N. J., talked on cardiac surgery in the dog and showed his film and color slides on heart surgery.

s/HENRI C. MARSH, *Secretary.*

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Texas Chapter.—The Texas A. & M. Student Chapter of the AVMA held its annual smoker on September 21. **Dean W. W. Armistead** welcomed the new students and introduced members of the faculty. **Dr. I. B. Boughton,** who

Robert F. Kahrs, president; Helen V. Coates, vice-president; mentarian; Paul T. Cardeilhac, sergeant-at-arms; Drs. H. E. Redmond and R. D. Turk, faculty advisors.

recently retired as dean, spoke to the students, complimenting them on their high scholastic standing. The honor code was discussed, and **Dr. J. H. Milliff**, president of Phi Zeta, told of the requirements for membership to this honor society and introduced its members. The president of the Chapter, **W. H. Smith, Jr.**, gave a report on the AVMA convention in Toronto, and told of the fine acquaintances he and his wife made among the representatives of student chapters and auxiliaries. E. D. Besch, editor of *The Southwestern Veterinarian*, gave a brief outline of the journal's development.

Dr. C. M. Patterson, the extension service veterinarian, was the speaker at the October 27 meeting. An interesting and dynamic speaker, Dr. Patterson emphasized the opportunities and duties of a veterinarian in community life.

At the November 17 meeting, **Dr. R. E. Starnes**, a small animal practitioner of Dallas, discussed a number of subjects suggested by members of the senior class. At this meeting, a representative of the Borden Company presented the Borden Award to E. D. Besch, the senior with the highest scholastic average.

The large and small animal clinics have just completed moving into a newly constructed, modern hospital building, which is west of the main campus. Of the students enrolled in the School of Veterinary Medicine, 96 per cent are members of the Student Chapter. We have a football team competing in intramural play and plan to enter teams in basketball, softball, and handball.

s/B. W. HENDERSON, *Secretary*.

WOMEN'S AUXILIARY

Brief History of the Loan Fund—At the meeting of the Women's Auxiliary to the AVMA in Columbus, 1920, the treasurer's report showed a balance of $545 on hand. Up to that time, there had been no demand for relief. In 1920, $545 was not a munificent sum, but certainly one commanding respect in an infant organization; but an infant organization without a live purpose could soon deteriorate into a dead one.

The President called for suggestions. A few rather hesitant ones were voiced. Finally, Mrs. J. H. McNeil, of New Jersey, proposed that the money be used in some way to assist students in veterinary colleges, who were handicapped by lack of sufficient funds. Mrs. McNeil concluded by making a motion authorizing the appointment of a committee to study the matter and report back to the Auxiliary the following year. Mrs. C. H. Stange of Ames, Iowa, Mrs. C. D. Folse of Kansas City, and Mrs. H. P. Hoskins of Detroit, were appointed. (For the record, Mrs. Hoskins was chairman.) This committee, through correspondence, consulted with the deans of the veterinary colleges and a few older members of the AVMA who were known to be interested in veterinary education, asking for opinions and ideas on the matter.

The suggestions thus received were coördinated and a tentative set of rules was drawn up, a copy of which was sent to each dean for further comment and criticism. These were assembled, studied by the committee, and a final draft of rules made to be sent to the Denver meeting, in 1921, for ratification by the Auxiliary. These same rules have remained in force, in approximately their original form, for thirty-two years, except for the amount of each loan. The sum available to each student has changed from time to time as a result of changing economic conditions. Copies of the rules in their final form, accompanied by a letter explaining the details of their operation, were sent to the colleges to be posted on bulletin boards where students could study them. Less than two weeks after the information was sent out, the first application was received. When necessary preliminaries had been performed, the first check was mailed and the first student loan launched. That was indeed a thrilling experience for the Women's Auxiliary of the American Veterinary Medical Association.

After that first loan, there were many interesting experiences in the years that followed. At least three pairs of brothers took advantage of the loans. This fact would seem to indicate the value which the young men placed upon the privilege accorded them. In several instances, loans were paid before they were due; in other cases, circumstances over which the young men had little control intervened to delay payment. Many businessmen expressed amazement that so many loans could be handled with so few delinquents. This certainly speaks well for the caliber of our veterinary students.

By 1924, the demands for loans had become so great that we could not possibly satisfy them. On the advice of the executive secretary of the AVMA, the secretary and treasurer of the Auxiliary went before the AVMA Executive Board and asked if the Auxiliary could borrow from that organization $2,000 to carry the Auxiliary through this emergency. The request was readily granted. As always, Dr. M. Jacob, who was for nearly twenty-five years treasurer of the AVMA, was most coöperative and considerate in arranging the details. As a consequence, the necessary business transactions were completed and the young men received their money in time for the opening of college in September. Again in 1930 and in 1933, the AVMA supplied small sums to carry the Auxiliary over some critical periods. Because of the conscientious and prompt payment of their loans by the students, all money received from the AVMA was repaid to that organization in a short time.

As the years passed, with strict economy, the

fund grew until, in 1939, it amounted to more than $5,000. At the convention in Memphis that year, all records and monies belonging to the Loan Fund were taken over and operated by the AVMA. In 1946, on order from the Auxiliary executive board, entire control of the loans, including records and bank balances, and full administration of the Fund were put back into the hands of the Auxiliary, where they now rest.

Statistics on Loan Fund, June 30, 1953.—Thirty-nine requests for applications for loans were received last year; 12 loans totaling $3,800 were made (all available funds exhausted); $8,600 out on loan June 30, 1953; $450 donated to Loan Fund by auxiliaries and individuals during the year 1952-1953; $278.70 received from auxiliaries since the Toronto meeting.

Several requests for information regarding loans have been received since September, 1953. Any contributions to the Loan Fund are appreciated as requests for loans are many and the need is great.

s/MRS. H. PRESTON HOSKINS.

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Central California Auxiliary.—The Women's Auxiliary to the Central California Veterinary Medical Association met at the Hotel Californian on October 27. The members attended a discussion on interior decoration at the California Drapery House. Refreshments were served at the home of Mrs. John Ruby.

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Illinois Auxiliary.—Members of the student auxiliary at the University of Illinois were honored guests at a tea given October 17 by the Women's Auxiliary to the Illinois State Veterinary Medical Association. This fourth annual tea was one of the women's activities in conjunction with the short course for veterinarians sponsored by the University of Illinois.

Mrs. A. E. Bott of Belleville, honorary president of the Women's Auxiliary to the International Veterinary Profession, and the American Mother of the Year, spoke on her experiences as Mother of the Year and reported on the recent meeting of the International Veterinary Congress in Stockholm.

The annual tea, a project of the state auxiliary, was under the direction of Mrs. L. A. Hill, vice-president, of Highland, and local committees of faculty wives headed by Mrs. R. D. Hatch and Mrs. Jesse Sampson of Champaign. Mrs. R. L. Poppenhouse, president-elect, Sterling, and Mrs. L. E. Boley, of Champaign, poured. Approximately 70 members and guests attended.

Radio Project.—In January, 1953, when the Auxiliary adopted as a project the promotion of the AVMA public information programs, one station, Kewanee, was using the programs, through the efforts of Mrs. G. I. Case. On Nov. 1, 1953, 11 stations representing all sections of the state were using the programs each week.

Chicago area network stations use items of veterinary information each week as part of regular farm programs. The University of Illinois station has regularly scheduled programs featuring faculty veterinarians. Although these two areas are not now using the AVMA scripts, their programs have the same purpose—good public relations for the profession.

Work on the project is still going ahead and the Auxiliary plans to continue contacting stations until listeners in all areas of the state have access to the programs. Auxiliary members and veterinarians have given splendid cooperation according to the project committee: Mrs. L. A. Hill, Highland; Mrs. C. A. Lemen, Warrensburg; and Mrs. L. J. Miller, Lincoln. Kits prepared by the committee contain form letters and information and are available to auxiliary members who are interested in contacting their local stations in regard to using the AVMA scripts.

s/(MRS. C. H.) CAROLINE J. ARMSTRONG,
Secretary.

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Louisiana Auxiliary.—The Women's Auxiliary to the Louisiana Veterinary Medical Association held its first fall meeting at the Hotel Bently in Alexandria on September 16-17.

On the first day, the luncheon and business meeting was attended by 23 members. That evening, the women joined their husbands at a lovely banquet.

On the second day, a coffee party was given by Mrs. C. A. Paige at her home, with 21 members present. Mrs. W. T. Oglesby gave an interesting and comprehensive review of the Toronto convention.

The Auxiliary took care of the radio and newspaper publicity for the meeting of the Louisiana Veterinary Medical Association, furnished the program for the banquet, and assisted in the registration.

s/(MRS. C. A.) ELIZABETH PAIGE, *President.*

APPLICATIONS

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

DAVIS, HAROLD C.
3832 Florence Dr., Alexandria, Va.
D.V.M., Alabama Polytechnic Institute, 1947.
Vouchers: W. O. Kester and J. B. Couch.

LAPUZ, NARCISO R.
2310 Roberts St., Pasay City, P. I.
D.V.M., University of Philippines, 1953.
Vouchers: J. B. Aranez and A. C. Gonzaga.

SCHNEIDER, WARREN J.
9020 West 24th Place, North Riverside, Ill.
D.V.M., Colorado A. & M. College, 1944.
Vouchers: E. W. Young and W. W. Fechner.

Second Listing

COBURN, GEORGE C., Station Veterinarian, Ft. Hood, Texas.
HOLK, HERBERT C., O.M.U. Box 552, Patrick A.F.B., Cocoa, Fla.
MILLER, ROBERT J., 27 Pioenweg, The Hague, Holland.
MORO, MANUEL, JR., Facultad de Medicina Veterinaria, Barranco, Lima, Peru.
SIBERT, HERBERT F., 226 W. Jackson Blvd., Chicago, Ill.

1953 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

University of Pennsylvania

PROBASCO, ROBERT E. L., V.M.D.
R.D. 1, Lebanon, Pa.
Vouchers: H. H. Hanshaw and R. O. Whipple.

Second Listing

Michigan State College*

O'CONNOR, JAMES T., D.V.M., Rt. 3, Ionia, Mich.
MILLER, JAMES R., D.V.M., 1719 Byrd Dr., Kalamazoo, Mich.

U. S. GOVERNMENT

Trainee Program in BAI for Junior Veterinary Students Announced.—Early in November, the U. S. Civil Service Commission mailed announcements, to the approved schools of veterinary medicine, of an examination for veterinarian (trainee) appointments in the Bureau of Animal Industry, U.S.D.A., for which junior veterinary students were eligible to apply. The appointments are for on-the-job training during summer vacations under the supervision of experienced veterinarians in disease control and eradication work, federal meat inspection, biological product control, and animal disease and parasite research.

This trainee program has the advantages of offering valuable experience to veterinary students and in making them eligible for appointments in the Bureau after graduation. Appointments are in Grade GS-5 with a salary rate of $3,410 a year for a forty-hour work week. The closing date for applications was Nov. 17, 1953.

The program has been used previously by the Bureau and proved successful.

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Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. Bureau of Animal Industry are reported as of Nov. 20, 1953.

NEW APPOINTMENTS

William F. Alexander, Fort Worth, Texas.
William L. Davidson, Nashville, Tenn.
Luciano B. Herrera, Mexico City, Mex.
Ries R. Lindley, Frankfort, Ky.
Richard H. Wilkinson, Fort Dodge, Iowa.
William P. Williams, Columbia, S. Car.

RESIGNATIONS

Roger W. Baker, Fort Worth, Texas.
Thomas H. Calvin, Los Angeles, Calif.
Luis A. Montanez-Rivera, San Juan, P. R.

RETIREMENTS

Edmund W. Burke, Cleveland, Ohio.
George W. Chapman, Pierre, S. Dak.
Elmer N. Davis, Kansas City, Kan.
Isaac A. Lucas, Moultrie, Ga.
John R. Pooley, Duluth, Minn.
Joseph H. Stephens, San Francisco, Calif.

TRANSFERS

William O. Caplinger, from New York, N. Y., to Buffalo, N. Y.
David E. Evans, from South St. Paul, Minn., to Grand Forks, N. Dak.
Foster J. Fike, from Albert Lea, Minn., to Austin, Minn.
Howard B. Fishback, from Buffalo, N. Y., to Moultrie, Ga.
Henry J. Gohde, from Albert Lea, Minn., to Austin, Minn.
Aaron R. Griffith, from Moultrie, Ga., to Orangeburg, S. Car.
Richard B. Myers, from Oklahoma City, Okla., to Baton Rouge, La.
Gerald V. Peacock, from Sioux City, Iowa, to Fort Dodge, Iowa.
Earl D. Richards, from Grand Forks, N. Dak., to Duluth, Minn.
Marshall J. Romine, from Albert Lea, Minn., to Cleveland, Ohio.
Clemence C. Walch, from St. Louis, Mo., to South St. Joseph, Mo.

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Dr. Collins Succeeds Dr. Moskey.—Dr. J. H. Collins (OSU '35) has succeeded the late Dr. H. E. Moskey as veterinary medical director in the Division of Medicine, Food and Drug Administration, Washington, D. C. Dr. Collins joined the Bureau of Animal Industry upon graduation and transferred to the Food and Drug Administration in 1943. He has been assistant veterinary medical director since 1946.

AMONG THE STATES AND PROVINCES

California

Central Association.—On October 27, the Central California Veterinary Medical Association met in the Hotel Californian in Fresno. After a film on teschen disease, Mr. Perry and

Mr. McBride, of the Bischoff Surgical Supply Company, demonstrated electric cautery. The guest speaker, **Mr. Owen Booth,** retiring director, Animal Shelter of the Fresno County Humane Society, discussed the relationship between the humane society and practicing veterinarians.

s/PAUL A. CARLSON, *Secretary.*

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Death of Dr. Carl E. Wicktor.—Dr. Carl E. Wicktor, county livestock inspector of Los Angeles County, died suddenly on Oct. 27, 1953,

Dr. Carl E. Wicktor

at the age of 58. Cause of death was a heart attack.

Born in Sherbourne County, Minnesota, on July 21, 1895, Dr. Wicktor received his degree in veterinary medicine from Kansas City Veterinary College in 1917. He engaged in general practice for a time and then was commissioned in the Army Veterinary Corps with active duty during 1918-1919 at Camp Greenleaf, Camp Devens, and Camp McClellan. From 1919 to 1925, he was employed in the meat inspection division, U. S. Bureau of Animal Industry, and then entered service with the Los Angeles County Livestock Department, being appointed county inspector on Dec. 1, 1950, following the retirement of Dr. L. M. Hurt.

Dr. Wicktor always took an active part in veterinary affairs and served his local, state, and national organizations notably and capably. He was a member of the Southern California Veterinary Medical Association since 1925 (president in 1945); the California State Association (president in 1951-1952) and was its delegate in the AVMA House of Representatives for a term from 1949 to 1952; he was reappointed for a second term from 1953 to 1956. Dr. Wicktor joined the AVMA in 1918 and served as resident secretary for California in 1948 and 1949.

He was a member of the U. S. Livestock Sanitary Association, a member of its committee on morbidity and mortality from 1950 to 1953, being chairman in 1952 and 1953. In 1953, a national morbidity and mortality reporting system was inaugurated under his chairmanship.

Dr. Wicktor was a member of the Kansas City Veterinary College Alumni Association and served as its president in 1951-1952. He was also a member of the Regional Health Services Advisory Committee to the Federal Civil Defense Administration for region 7, member of the Southern California Advisory Committee to the Selective Service System, member of the California State-wide Brucellosis Committee and of the agricultural committee of the Los Angeles Chamber of Commerce.

He is survived by his widow, Mrs. Dora Wicktor, of 290 Twickenham Avenue, Los Angeles; two brothers, and three sisters.

District of Columbia

New Armed Forces Institute of Pathology Building.—The cornerstone of the new Armed Forces Institute of Pathology building was laid on Oct. 20, 1953, at the Walter Reed Army Medical Center. The director of the Institute, **Brig. Gen. E. De Coursey,** presided at the ceremony. Assistant Secretary of Defense **M. A. Casbert** was the principal speaker. In reviewing the history of the Institute from the time it was founded in the midst of the Civil War, he said, "It is significant that the first structure erected by the joint Armed Forces is not an arsenal or a battleship, but a building dedicated to the service of humanity."

Occupancy of the building is slated for late spring in 1954. It will have five stories above ground and three below, and is one of the first institutions in the Washington area designed for resistance to an A-bomb attack.

Illinois

Mississippi Valley Association.—On Nov. 4-5, 1953, the Mississippi Valley Veterinary Medical Assoication held its forty-ninth annual meeting at the Hotel Pere Marquette in Peoria.

The following speakers participated in the program: **Drs. R. J. Kirkpatrick,** Galesburg; **Clifford A. Lemen,** Warrensburg, president of the Illinois State V.M.A.; **A. C. Gathmann,** Galva; **William F. Riley, Jr.,** School of Veterinary Medicine, Michigan State College, East Lansing; **L. M. Hutchings,** Department of Veterinary Science, Purdue University, Lafayette, Ind.; **J. W. Albrecht** and **H. L. Marsh,** Princeton; **C. C. Morrill,** College of Veterinary Medicine, University of Illinois, Urbana; **E. A. Woelffer,** Oconomowoc, Wis.; **A. K. Merriman,** superintendent, Division of Livestock Industry, Springfield; **N. D. Levine,** College of Veterinary Medicine, University of Illinois, Urbana;

Wayne H. Riser, Skokie; and **J. O. Alberts,** College of Veterinary Medicine, University of Illinois, Urbana.

s/A. C. GATHMANN, *Secretary.*

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Chicago Association.—The Chicago Veterinary Medical Association met at the Palmer House on Nov. 10, 1953, to hear **Dr. Joseph K. Narat** (M.D.), University of Illinois School of Medicine, discuss the application of surgical procedure in man to canine surgery.

s/WAYNE H. RISER, *Secretary.*

Indiana

Sixth District Association.—On November 4, the Sixth District (Ind.) Veterinary Medical Association met in Lebanon to hear **Dr. C. C. Dobson,** Augusta, discuss pitfalls in the practice of veterinary medicine.

The following officers serve this Association: Drs. H. G. White, Frankfort, president; Harry Blair, Brownsburg, vice-president; John Coltrain, Darlington, secretary-treasurer. Dr. D. L. Hughes of New Market was elected to the board of directors.

The women were entertained by Dr. and Mrs. Paul Taner, Jr., of Lebanon.

s/J. L. KIXMILLER, *Resident Secretary.*

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Ninth District Association.—Dr. Roy H. DeMott of Odon discussed "The Available Antibiotics" at the October 30 meeting of the Ninth District (Ind.) Veterinary Medical Association.

Dr. and Mrs. W. A. Brown were hosts.

s/J. L. KIXMILLER, *Resident Secretary.*

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Northwestern Association.—The Northwestern Indiana Veterinary Medical Association met in Remington on October 29. The guest speaker was **Mr. James Gardiner** of Fowler who spoke on some experiences of the F.B.I.

The women were entertained at the home of the hosts, Dr. and Mrs. Leo Andres.

s/J. L. KIXMILLER, *Resident Secretary.*

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Michiana Association.—The Michiana Veterinary Medical Association met in the Hotel LaSalle in South Bend on November 12. The guest speaker was **Dr. W. O. Brinker** of Michigan State College, East Lansing, who gave an interesting talk, with illustrations, on the advancement in bone setting made by the veterinary profession.

s/BRUCE HOSTRAWSER, *Secretary.*

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Dr. Axby Featured in News Story.—The *Indianapolis Times,* September 29, had a feature story on Dr. J. Leonard Axby (CVC '03), of Indianapolis. Dr. Axby has the distinction of having served as a mayor, a legislator, and twelve years as a state veterinarian. He is still actively practicing.

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Tenth District Association.—The Tenth District (Ind.) Veterinary Medical Association met in Pendleton on November 4. The guest speaker was **Dr. V. W. Gesellchen** who spoke on "What's New in Swine Diseases." Dr. Gesellchen is with the diagnostic laboratory of the Corn States Serum Company, Omaha, Neb. A lively discussion followed his presentation.

Dr. and Mrs. Hugh D. Mingle were hosts.

s/J. L. KIXMILLER, *Resident Secretary.*

Iowa

Midwest Small Animal Association and Regional Meeting of A.A.H.A.—The sixteenth annual meeting of the Midwest Small Animal Association and Regional Meeting of the American Animal Hospital Association was held Nov. 18-19, 1953, in the Hotel Burlington, in Burlington.

The following speakers appeared on the program: **Mrs. Paul T. White,** Indianapolis, Ind.; **Drs. Bennett J. Porter,** Minneapolis, Minn.; **O. Norling-Christensen,** Wilmette, Ill.; **R. B. Koger,** Joplin, Mo.; **A. Grant Misener,** Chicago; **I. A. Merchant,** dean, School of Veterinary Medicine, Iowa State College, Ames; **A. H. Groth,** dean, School of Veterinary Medicine, University of Missouri, Columbia; **Robert Graham,** dean, College of Veterinary Medicine, University of Illinois, Urbana; **H. C. H. Kernkamp,** dean, School of Veterinary Medicine, University of Minnesota, St. Paul; **Irvin P. Irwin,** Iowa City; **George R. Burch,** New Augusta, Ind.; **C. L. Miller,** Oak Park, Ill.; **Deets Pickett,** Kansas City, Mo.; **Frank R. Booth,** Elkhart, Ind.; **Loyal C. Payne,** School of Veterinary Medicine, Iowa State College, Ames: **J. J. Fishler,** Elkhart, Ind.; and **C. E. DeCamp,** New York, N. Y.

s/J. PORTER COBLE, *Secretary.*

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Interstate Association.—The Interstate Veterinary Medical Association held its thirty-ninth annual meeting in Sioux City, October 29 and 30, with **Dr. L. T. Railsback,** Ellsworth, Minn., presiding. An excellent program included as speakers **Drs. A. H. Quin,** president-elect of the AVMA; **W. A. Hagan,** Ithaca, N. Y.; **Rue Jensen,** Fort Collins, Colo.; **E. F. Eveleth,** Fargo, N. Dak.; **S. S. Bjornson,** West Fargo, N. Dak.; **R. E. Lubbenhusen,** St. Louis, Mo.; and **M. K. Jarvis,** Omaha, Neb. About 200 were in attendance. Dr. E. G. Cole, of Sioux City, was elected president for 1954.

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Dr. Young and Son Featured in News Story.—Dr. Frank B. Young (KSC '19) and his son, Dr. F. W. Young (ISC '51), were recently featured in the *Des Moines Tribune* under the heading "Veterinarian Is Big Factor in Iowa's Wealth." Like many another outstanding practitioner, Dr. Young preferred to locate in a small town. He has practiced in Waukee for thirty-four years but now has a partner, his son. He now has more time to devote to his

duties as secretary of the Iowa Veterinary Medical Association and editor of the *Iowa Veterinarian.*

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Conference on Swine Erysipelas.—The cause and control of swine erysipelas was discussed at Sioux City on October 7, at a conference sponsored by the Livestock Sanitary Committee. **Dr. R. D. Shuman,** of the Bureau of Animal Industry, and **Dean I. A. Merchant,** Iowa State College, participated. In a recent slaughter test of 118,000 hogs, nearly 2,000 hams were rejected because of arthritis, most of which probably were due to chronic erysipelas infection.

Maine

Personals.—Dr. Harold Chute, who recently completed his master's degree in animal pathology at the Ohio State University, on an AVMA Fellowship, has instituted research at the University of Maine, Orono, to test a bronchitis vaccine which might solve one of the state's major problems.

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Dr. Stanford D. Merrill has given up practice to join the staff of the Division of Inspections, Maine Department of Agriculture, which is primarily concerned with meat and poultry inspection.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Association was held November 18 at the Hotel Beaconsfield in Brookline. **Dr. Stephen J. Roberts,** Department of Medicine and Obstetrics, New York State Veterinary College, Ithaca, was the guest speaker.

s/C. LAWRENCE BLAKELY, *Secretary.*

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Dr. Schnelle Elected President of New England Association.—Dr. Gerry B. Schnelle, chief of staff at the Angell Memorial Animal Hospital, Boston, has succeeded Dr. James W. Armstrong of Cranston as president of the New England Veterinary Medical Association. The Association meeting was held October 19 at Newport, R. I., with President James A. McCallam of the AVMA as a principal speaker. Dr. Sidney Stiles of Falmouth Foreside, N. H., was named president-elect.

Minnesota

Recent Appointments to Staff of Veterinary School at University of Minnesota.—Dr. R. A. Kathein (CAL '53) was appointed an instructor in parasitology, and Mr. R. K. Lindorfer (M.S., MIN '53) as an instructor in bacteriology. Dr. Dale K. Sorenson (KSC '46) joined the staff as an assistant professor in medicine. Earlier this year, he received his Ph.D. from the University of Wisconsin. Dr. R. M. Schwartzman (UP '52) also became an instructor in medicine. Dr. R. Zemjanis (STK '48) was appointed an instructor in veterinary obstetrics.

Dr. J. J. Clark (GA '53) was awarded a research fellowship to work on swine brucellosis, and Dr. J. P. Sullivan (COL '53) holds a fellowship to conduct studies on infertility in cattle.

s/HENRY J. GRIFFITHS, *Resident Secretary.*

Missouri

Kansas City Association.—Members of the Kansas City Veterinary Medical Association met in the Continental Hotel on November 17. The guest speaker, **Dr. John Cady,** Arlington, Neb., discussed some common diseases of calves; and the motion picture, "Outbreak," was shown.

s/J. C. DAVIS, *Secretary.*

New Hampshire

Parturient Paresis-Ketosis Research.—Dr. Frank Vigue, working with others, has secured a grant of $7,000 for the first year of a long-term experiment on the role of nutrition in these metabolic diseases, to be carried on at the University of New Hampshire. The first phase of the study will be on the influence of the plane of nutrition during the dry period and immediately after parturition.

New York

State Society.—The New York State Veterinary Medical Society held its annual meeting Sept. 14-16, 1953, at the Hotel Syracuse in Syracuse, at which time the following officers were

Dr. Walter D. Way, president of the New York State Veterinary Medical Society.

elected for 1954: Drs. Walter D. Way, Westport, president; Clyde L. Kern, Scarsdale, president-elect; William J. Sellman, Utica, treasurer.

The literary program was well planned and included such personalities as **Mr. Robert C. Killough, Jr.**, assistant commissioner for professional education, New York State Department of Education, who gave a fine talk highlighting organized power; **Theodore Kazimiroff,** D.D.S., of Bronx, presented a paper on "Practical Management of Dental Diseases of Carnivorous Animals"; and **Dr. G. Harold Warnock,** M.D., spoke on "Responsibilities of the Veterinarian in Public Health."

Other out-of-state speakers were: **Drs. Leonard J. Abell,** Rome, Pa.; **James Archibald,** head, Division of Small Animal Medicine and Surgery, Ontario Veterinary College, Guelph; **Robert L. Leighton,** assistant chief of staff, Rowley Memorial Hospital, Springfield, Mass.; **James H. Mark,** University of Pennsylvania School of Veterinary Medicine, Philadelphia; **George L. Ott,** director of biological research, Fromm Laboratories, Inc., Grafton, Wis.; **Hubert C. Smith,** veterinary field consultant and diagnostician, Allied Laboratories, Inc., Sioux City, Iowa; **Forrest F. Tenney,** Peterborough, N. H.; **Charles J. York,** director, veterinary biological research, Pitman-Moore Company, Indianapolis, Ind.

The **Honorable Paul L. Talbot,** member of the New York State Assembly, was the speaker at the annual dinner.

The outstanding entertainment feature was a clambake, at which guests and members were entertained by the local committee on arrangements.

The membership voted to hold the next annual meeting in Saranac Inn, Saranac, N. Y., on Sept. 15-17, 1954.

s/JOAN S. HALAT, *Acting Executive Secretary.*

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Regional Meeting, A.A.H.A.—The eastern regional meeting of the American Animal Hospital Association was held at the New York Academy of Sciences on November 4.

The following speakers comprised the program: **Drs. Louis A. Corwin, Leonard J. Goss,** zoo veterinarian, and **Clarence P. Zepp, Jr.,** of New York City; and **F. E. Eads,** Parke, Davis and Co., Detroit, Mich.

s/WAYNE H. RISER, *Executive Secretary.*

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New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held Dec. 2, 1953, at the New York Academy of Sciences. After the motion picture, "A Basic Review of Cortisone and Its Application in the Field of Medicine," was shown, **Dr. Calvin Moon,** Trenton, N. J., discussed the use of cortisone in small animal practice. **Dr. Shefford Miller,** president of the state Association, presented a review of the 1952-1953 presidential year.

s/C. E. DECAMP, *Secretary.*

North Carolina

Roanoke-Tar Association Changes Its Name.—Dr. C. B. Randall, Kinston, secretary of the Roanoke-Tar Veterinary Medical Association, recently announced that the name of this Association has been changed to Eastern North Carolina Veterinary Medical Association.

Ohio

New Research Center Opened.—The Ohio Agricultural Experiment Station in Wooster held dedication ceremonies and open house on

Dr. W. R. Krill (left), Mr. W. E. Krauss, and Dr. B. H. Edgington at the dedication of the Veterinary Science Research Center, Wooster, Ohio.

Nov. 4, 1953, at the newly established Veterinary Science Research Center.

The dedication program was under the direction of W. E. Krauss, associate director, Ohio Agricultural Experiment Station, and included an address of welcome from **L. L. Rummell,** dean, College of Agriculture; introductions by **Dr. B. H. Edgington,** chairman, Department of Veterinary Science, Ohio Agricultural Experiment Station; an address on research and education by **Dr. W. R. Krill,** dean, College of Veterinary Medicine, Ohio State University; and a feature address, "The Role of Veterinary Science Research in Our Present Day Society," by **Dr. B. T. Simms,** chief, Bureau of Animal Industry, Washington, D.C.

Nearly 200 persons attended the dedication program which was held in the Administration Building, and was followed by an inspection tour of the facilities of the Veterinary Science Research Center, including three new buildings that have been recently erected to permit an enlarged disease research program, at the Ohio Agricultural Experiment Station.

Refreshments were served at an open house

reception in one of the new buildings by the wives of staff members of the Department of Animal Science.

Pennsylvania

Bucks-Montgomery Association.—The Bucks-Montgomery Veterinary Medical Association met at the Moose Home in Doylestown on November 11. The program consisted of a round-table discussion of impressions of the Pittsburgh convention.

s/V. W. RUTH, *Secretary.*

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Keystone Association.—The November 25 meeting of the Keystone Veterinary Medical Association was held at the School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

A report was made by **Dr. J. V. McCahon,** of Downingtown, and **Dr. C. W. Baker,** Kennett Square, on the Northeastern Mastitis Council which was held during October. **Dr. C. O. Newhaus** of the Pennsylvania Bureau of Animal Industry, reported on the brucellosis control program in the Philadelphia, Bucks, Chester, Delaware, and Montgomery counties. **Dr. S. F. Scheidy,** Drexel Hill, discussed the recent meeting of the Pennsylvania State Brucellosis Committee and gave an illustrated talk on observations in Scandinavia and Europe.

s/RAYMOND C. SNYDER, *Secretary.*

Saskatchewan

Death of Dr. Wright.—A pioneer veterinary surgeon, Dr. Norman Wright, professor emeritus of veterinary science at the University of Saskatchewan, died at Saskatoon Aug. 23, 1953, after a brief illness. He was 72 years old.

His work with horses and cattle, his assistance in the early years of the province in drafting regulations for veterinary practice and livestock health, and in recent years his veterinary columns in *The Western Producer* and the *Western Cattleman,* made Dr. Wright known to thousands of prairie farmers, and he was the valued friend of many breeders and exhibitors.

Born at Bradford, England, in 1881, Dr. Wright came to Canada in the early years of this century, taking his degree in veterinary science at the Ontario Veterinary College. Later he did postgraduate work at Cambridge University and Michigan State College.

He settled in Saskatoon in 1907 and was a member of the original teaching staff at the University of Saskatchewan in 1912. His association with the university as a lecturer and professor continued, with a break for war service, until his retirement in 1947.

For many years he was consultant to veterinarians in the province, a charter member of the Veterinary Association of Saskatchewan, and its registrar. He was made a life member of the association in 1946. He joined the AVMA in 1913.

Dr. Wright wrote extensively on veterinary surgery and was the author of a book, "Health of Animals," published in 1949.

He is survived by his widow, Dr. Anna Nicholson, in Saskatoon, and one sister in England.

Vermont

Dr. Wilder Addresses Riding Club.—Dr. A. G. Wilder, Rutland, addressed members of the Riding and Driving Club at their annual dinner meeting at the Shelburne Hotel in Shelburne on Oct. 24, 1953. Dr. Wilder has been official veterinarian of this group for four years.

s/W. D. BOLTON, *Secretary.*

Washington

Death of Dr. John A. Thompson.—Dr. John A. Thompson, 69, retired prominent federal veterinarian, passed away at his home in Spokane, Wash., on Nov. 10, 1953, after an extended illness.

Dr. Thompson was born near Edwardsville, Kan., on Jan. 14, 1884. After receiving his D.V.M. degree from Kansas State College, he served as federal veterinarian in the Philippine Islands until 1913 when he was transferred to the meat inspection service in the States. Most of the time from 1914 until 1930, he served as a supervising veterinary meat inspector at Kansas City, Kan. He was transferred to Grand Forks, N. Dak., as inspector in charge in 1930, and to Fargo in 1932. In 1941, he was transferred to Spokane, Wash., as inspector in charge of the Bureau of Animal Industry activities in that area, where he remained until his retirement.

Dr. Thompson was an active member of the Presbyterian Church in Spokane, a life member of the Bonners Springs, Kansas Masonic Lodge, and the Association of Federal Veterinarians, and was a member of the AVMA from 1915 to 1948. He is survived by his widow, one daughter, and three grandchildren.

Wisconsin

Northeastern Association.—The annual meeting of the Northeastern Wisconsin Veterinary Medical Association was held in Seymour on Oct. 22, 1953.

The program speakers were: **Drs. H. J. O'Connell,** Madison, and **E. P. Pope,** Madison; other members discussed new lines of treatment and gave case reports on some of the diseases that have become prevalent in this area.

At the business session, the following officers were elected: Drs. W. E. Burmeister, Pulaski, president; William Madson, Appleton, secretary; and H. R. Trombley, Appleton, treasurer.

About 70 members and their guests attended the evening program and dinner, at which **Dr. R. C. Finkle** was master of ceremonies.

s/WILLIAM MADSON, *Secretary.*

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Conference of Artificial Breeders.—The National Association of Artificial Breeders met in

Lansing, Mich., Sept. 13-16, 1953. Several veterinarians attended the conference and participated in the program. Dr. E. A. Woelffer represented the AVMA at the Conference.

Dr. I. F. Huddleson of Michigan State College briefly outlined the method for control of brucellosis. Others who participated were **Drs. W. H. Dreher,** Shawano, Wis.; **J. W. Pirie,** Cedar Rapids, Iowa; and **R. J. McDonald** of Woodstock, Ont.

Dr. C. R. Huffman of Michigan State College gave one of his entertaining talks on "Roamin' in the Rumen." He emphasized the necessity for increased milk production and the benefits of feeding roughage of greater nutritive value. **Dr. R. E. Hodgson,** assistant chief, Bureau of Dairy Industry, discussed the D.H.I.A. sire-proving program and the effect of heredity and environment on production. The N.A.A.B. has recently employed a full-time executive secretary, Harry Herman, Ph.D., formerly of the University of Missouri. He is widely known as an author and cattle judge and has a well-rounded experience with livestock production and research.

s/E. A. WOELFFER.

FOREIGN NEWS

Finland

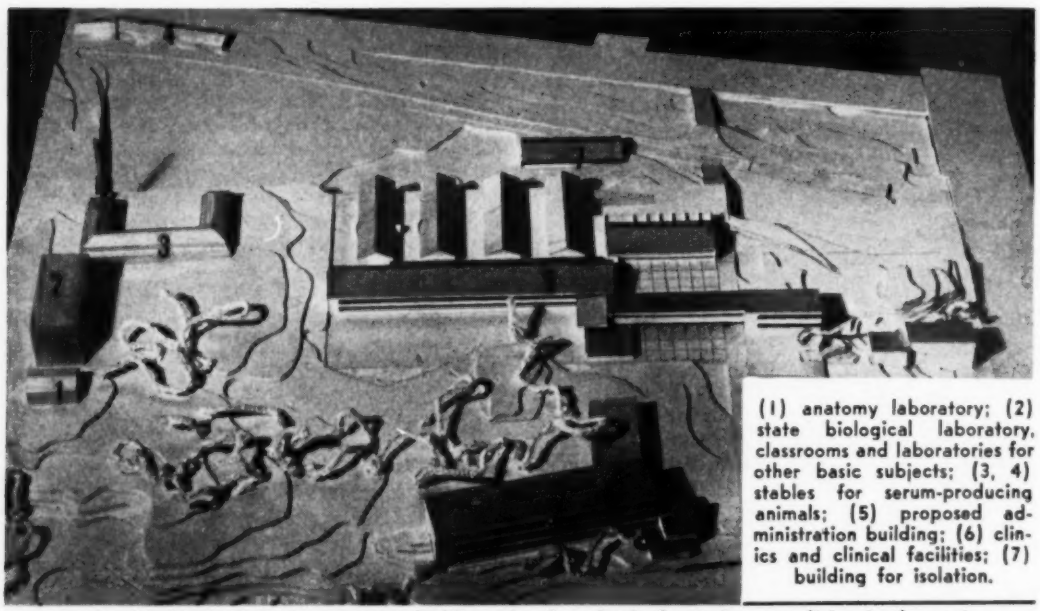
Veterinary Medicine in Finland.—Following the Stockholm meeting of the International Veterinary Congress in August, 1953, I visited Finland, the land of my forefathers.

Finland is roughly the size of California with 9 per cent of its area under cultivation. About 60 per cent is forest and it has an enormous labyrinth of lakes, rivers, and islands. The upper third is above the Arctic Circle and, from the northern tip, the midnight sun can be seen from mid-May through July. Yet, because of the gulf stream the climate is temperate.

Finland has a population of 4 million hardy, thrifty people, with about 10 per cent living in Helsinki at the southern tip which extends, like a broad peninsula, into the Baltic Sea. At Helsinki, a long-planned but oft-postponed veterinary school may one day be built.

Finland has 300 veterinarians employed as follows: 90 in public health service, including meat and milk inspection; 100 in community service; 70 in district service; 15 in the army; and only 25 devoting their full time to private practice. However, those in public health service and in community service are paid to care for local diseased animals as would a general practitioner, so they might be considered as in part-time private practice. An estimated total of 450 to 500 veterinarians is needed in Finland; therefore, plans to build a school have again been resumed.

A school of veterinary medicine was first proposed in about 1787, again in 1822, and periodically since. But not until 1906 did the Finnish Senate seriously consider definite plans. However, before these plans could be launched World War I intervened. Again in 1923 plans were developed but because of the postwar depression and the nation's determination to



(1) anatomy laboratory; (2) state biological laboratory, classrooms and laboratories for other basic subjects; (3, 4) stables for serum-producing animals; (5) proposed administration building; (6) clinics and clinical facilities; (7) building for isolation.

Fig. 1—Model showing the proposed buildings for the school of veterinary medicine in the center and at right, with the present buildings on the left, to be erected in Helsinki.

meet the payments on her war debts, insufficient funds were available.

In 1932, a 13-acre plot was allotted in Helsinki for the school and in 1937 modern laboratories for animal disease diagnosis and for the production of biological products were built. Funds were allotted in 1939 to start building the veterinary school proper but this time World War II intervened. Now the planning has been renewed, but still the economic situation is not very favorable. In addition to the usual classrooms and laboratories, there are plans for a fish, meat, and milk hygiene laboratory, clinics which will accommodate about 100 large and 100 small animals, and an isolation building for animals with contagious diseases.

In 1938, scholarships were provided for teachers to study in foreign schools but the war interrupted that program. In 1945, a law authorized the present veterinary curriculum wherein two and one-half years of preclinical classes are held in the present buildings and three and one-half years of clinical training is given, with 15 students at Stockholm and five at Oslo, annually.

A laboratory for diagnosis was first provided in 1908 with a personnel of three. Now there is a staff of 40 with 85,034 animal disease investigations recorded in 1952. Besides disease diagnosis, these services include food hygiene, pregnancy tests, production of serums and vaccines, research, and disease prophylaxis and therapy. Dr. V. Rislakki has been in charge since 1949.

The agricultural income in Finland is 48 per cent from cattle (chiefly from milk), 10 per cent from swine, and 6 per cent from other animals. The livestock population includes 180,000 reindeer, about 1 million sheep, and 5 million chickens. An artificial insemination program was launched in 1949 with 49,000 (5%) of the cows now serviced. Of the 96 bulls used, 38 are Ayrshires and 18 are Finnish breeds. Horses are gradually being displaced by tractors.

Except along the long eastern border with Russia, Finland is well isolated, making disease control practical. No livestock or poultry is imported.

Pullorum disease in chickens has been eradicated. Rabies is checked by keeping the dogs, about 10,000, along the Russian border vaccinated. Foot-and-mouth disease was eradicated in 1938 and did not reappear until November, 1952, when 120 herds in eastern Finland were affected. It was again eradicated by slaughter plus vaccination of about 80,000 animals in the surrounding area.

The Finnish Veterinary Society, to which almost all veterinarians belong, was founded in 1892. Its activities are managed by a board of directors, with a chairman and nine members. An annual meeting is held in October. The Society has its own publication and also cooperates with the other Scandinavian veterinary societies in publishing *Nordisk Veterinarmedicin*. There are also six provincial veterinary associations as well as societies for those in the various veterinary services, such as the Rural Veterinarian Association.—*Edwin Laitenin, D.V.M., West Hartford, Conn.*

British West Indies

British Caribbean Association.—The Trinidad Branch of the British Caribbean Veterinary Medical Association held its monthly meeting on November 13, and the guest speaker was **Dr. Fulvio Jose Alice**, director of the Institute of Biology, of Bahia, Brazil, who was passing through the Island in transit from a visit to the United States on his way home. Dr. Fulvio Jose Alice has done extensive research work on Rabies and gave his audience a most interesting lecture on the recent developments along this line. He spent an enjoyable week on the island and was very coöperative with the government veterinary department with their problems of this disease.

Active plans are on foot to sponsor a veterinary convention in 1954 on this island and, although the date and details are not yet estab-

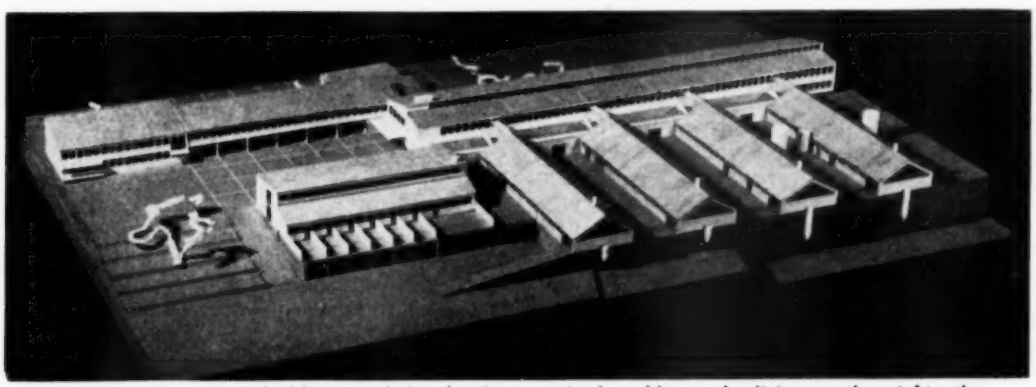


Fig. 2—The clinical buildings include the large animal stables and clinic on the right, the small animal clinic on the left front, and classrooms on the far left, rear, in the proposed plans for the Helsinki veterinary school.

lished, all indications seem to indicate that this branch will be able to activate the convention in coöperation with the other branches of the British Caribbean Veterinary Medical Association.

This would be an excellent opportunity for our American colleagues to visit the tropical Caribbean, and combine a good vacation in the land of calypso music, rum punches, warm sea water beaches, and interesting people.

s/S. P. BENNETT, *Resident Secretary.*

VETERINARY MILITARY SERVICE

Air Force Command Veterinarians Conference.—An Air Force Command Veterinarians Conference was held during Oct. 5-7, 1953, at the office of the Surgeon General, U.S.A.F., Washington, D. C., in conjunction with the Command Surgeons Conference. The conference was conducted under the auspices of Brigadier General Wayne O. Kester, assistant for veterinary services, and members of his staff, comprising Lt. Col. J. B. Couch, Lt. Col. Jack H. Hempy, and Major Frederick W. Clayton.

In attendance at the conference were Col. Robert R. Miller, Col. Richard H. Jurden, Lt. Col. William B. Snodgrass, Lt. Col. John R. Nettles, Jr., Lt. Col. Marley C. Clark, Lt. Col. Norbert A. Lasher, Lt. Col. Neil G. MacEachern, Lt. Col. William G. Phifer, Lt. Col. Ralph D. Walters, Lt. Col. Rowland W. Rushmore, and Lt. Col. Robert L. Hummer.

The following speakers addressed the group: **Major Gen. Harry G. Armstrong,** Surgeon General U.S.A.F.; **Brig. Gen. J. L. Hartman,** chief, Veterinary Division, Department of the Army; **Lt. Col. Jack C. Carmichael,** chief sanitary engineer, Preventive Medicine Division, Office of the Surgeon General, U.S.A.F.; **Col. Theodore Bedwell, Jr.,** chief, Preventive Medicine Division, Office of the Surgeon General, U.S.A.F.; and **Lt. Col. Charles C. Haines,** Facilities Division, Office of the Surgeon General, U.S.A.F.

The main discussions centered around the operation and organization of the Air Force Veterinary Service, as well as staffing and professional matters. An additional point of discussion consisted of broader and more effective utilization of veterinary officers. The meeting was an outstanding success and brought to light many questions and problem areas which were resolved by interchange of ideas and discussion.

BIRTHS

Dr. (ISC '49) and Mrs. William E. Ribelin, Amsterdam, Holland, announce the birth of son, Robert Ellis, on Aug. 23, 1953. The Ribelins will return to this country in July.

Dr. (OSU '47) and Mrs. Abraham L. Gorowoy, Freehold, N. J., announce the birth of a son, Ronald Mark, on Oct. 14, 1953.

Dr. (UP '52) and Mrs. John F. Patt, Boyertown, Pa., announce the birth of their second child, Deborah Susan, on Oct. 26, 1953.

Mr. and Mrs. John D. Bryant (Irene F. Woods, WSC '47), Lakewood, Colo., announce the birth of a son, Terry Woods, on Nov. 5, 1953.

DEATHS

★**Francis R. Comber** (CVC '09), 75, Marquette, Mich., died Nov. 15, 1953. Dr. Comber had practiced in Ohio and Michigan for forty years. He had moved to Marquette three years ago after practicing for several years in the Port Huron area. Dr. Comber was a member of the AVMA.

★**Harry C. Crawford** (UP '09), 68, Jamaica, N. Y., died Nov. 1, 1953. Dr. Crawford, a general practitioner, was admitted to the AVMA in 1909.

★**Gustave B. Henno** (SF '07), 71, San Francisco, Calif., died Oct. 10, 1953. Dr. Henno specialized in small animal practice. He is survived by his widow.

Dr. Henno was admitted to the AVMA in 1918.

Albert C. Masten (MSC '21), Scottville, Mich., died recently. Dr. Masten was a general practitioner.

★**James T. Moffitt** (IND '18), 60, Glendale, Calif., died September 18, 1953. Dr. Moffitt, who was a representative for the Hyman-Westcott and Denny Company, joined the AVMA in 1942. He is survived by his widow.

Joseph G. Moon (UP '16), 65, Philadelphia, Pa., died Nov. 20, 1953. Dr. Moon was retired chief of the Division of Milk, Livestock, Meat and Food of the Philadelphia Department of Public Health. He served in the U. S. Army during World War I. Dr. Moon is survived by a sister.

Frank J. Muecke (IND '01), 73, Indianapolis, Ind., died Nov. 4, 1953. Dr. Muecke was a meat inspector for the Indianapolis Board of Health. He had been a member of the AVMA.

John A. Thompson (KCV '07), 69, Spokane, Wash., died Nov. 10, 1953. An obituary appears on page 85 of this JOURNAL.

N. M. Wheeler (SW '12), 70, Winnsboro, Texas, died Oct. 12, 1953. Dr. Wheeler, who was widely known in northeastern Texas, was still in active practice at the time of his death. He is survived by three daughters. His wife died July 4 of this year. Dr. Wheeler had been a member of the AVMA.

★**Norman Wright** (ONT '07), 72, Saskatoon, Saskatchewan, died Aug. 23, 1953. An obituary appears on page 85 of this JOURNAL.

F. D. Yeager (CVC '91), Lena, Ill., died July 16, 1953. Dr. Yeager was a general practitioner.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

University of Pennsylvania. Annual conference for veterinarians. University of Pennsylvania, School of Veterinary Medicine, Philadelphia, Pa., Jan. 5-6, 1954. Walter E. LaGrange, chairman, conference committee.

New York State Veterinary College. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 6-8, 1954. W. A. Hagan, dean.

Ohio State Veterinary Medical Association. Annual meeting. Deshler-Hilton Hotel, Columbus, Ohio, Jan. 6-8, 1954. William S. Konold, 50 E. Broad St., Columbus 15, Ohio, executive secretary.

Oklahoma Veterinary Medical Association. Annual winter meeting. Mayo Hotel, Tulsa, Okla., Jan. 11-12, 1954. W. D. Bowerman, Oklahoma City, Okla., secretary.

Tennessee Veterinary Medical Association. Annual meeting. Nashville, Tenn., Jan. 11-12, 1954. H. W. Hayes, 734 Broadway, Knoxville, Tenn., secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 13-15, 1954. W. W. Garverick, Zionsville, Ind., secretary.

Ontario Veterinary Association. Annual meeting. Royal York Hotel, Toronto, Ont., Jan. 14-16, 1954. G. A. Edge, Box 37, Postal Station "F", Toronto, Ont., secretary.

Mississippi State Veterinary Medical Association. Annual meeting. Jackson, Miss., Jan. 17-19, 1954. John A. Randle, 122 Commerce St., West Point, Miss., secretary.

Kansas State Veterinary Medical Association. Annual meeting. Broadview Hotel, Wichita, Kan., Jan. 17-19, 1954, K. Maynard Curts, Kansas City, Kan., secretary.

Virginia State Veterinary Medical Association (in conjunction with the West Virginia Veterinary Medical Association). Annual meeting. Greenbrier Hotel, White Sulphur Springs, W. Va., Jan. 17-19, 1954. A. J. Sipos, Richmond, Va., secretary.

West Virginia Veterinary Medical Association (in conjunction with the Virginia State Veterinary Medical Association). Annual meeting. Greenbrier Hotel, White Sulphur Springs, W. Va., Jan. 17-19, 1954. E. R. Coon, Charleston 5, W. Va., secretary.

Intermountain Veterinary Medical Association. Annual meeting. Newhouse Hotel, Salt Lake City, Utah, Jan. 18-20, 1954. A. P. Schneider, Boise, Idaho, director, BAI.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 19-21, 1954. F. B. Young, Waukee, Iowa, executive secretary.

Michigan State College. Annual postgraduate conference for veterinarians. Michigan State College, East Lansing, Mich., Jan. 20-21, 1954. G. R. Moore, Department of Surgery and Medicine, chairman.

Texas Veterinary Medical Association. Annual meeting. Hotel Galvez, Galveston, Texas, Jan. 24-26, 1954. Alvin A. Price, College Station, Texas, executive secretary.

California State Veterinary Medical Association. Midwinter convention. Veterinary Science Building, University of California, Davis, Calif., Jan. 25-27, 1954. A. M. McCapes, Box 726, San Luis Obispo, Calif., program chairman.

Minnesota State Veterinary Medical Society. Annual meeting. St. Paul Hotel, St. Paul, Minn., Jan. 25-27, 1954. B. S. Pomeroy, St. Paul, Minn., secretary.

North Carolina Veterinary Medical Association. Annual conference for veterinarians. North Carolina State College, Raleigh, N. Car., Jan. 27-29, 1954. C. D. Grinnells, chairman.

Louisiana State University. Annual conference for veterinarians. Louisiana State University, Baton Rouge, La., Feb. 3-4, 1954. W. T. Oglesby, Department of Veterinary Science, chairman.

Wisconsin Veterinary Medical Association. Annual meeting. Schroeder Hotel, Milwaukee, Wis., Feb. 4-6, 1954. B. A. Beach, Madison, Wis., secretary.

Illinois State Veterinary Medical Association. Annual meeting. Morrison Hotel, Chicago, Ill., Feb. 10-12, 1954. A. G. Misener, 6448 N. Clark St., Chicago 26, Ill., secretary.

Colorado A. & M. College. Annual conference for veterinarians. Glover Veterinary Hospital, School of Veterinary Medicine, Colorado A. & M. College, Feb. 15-17, 1954. O. R. Adams, director of veterinary clinics.

Missouri Veterinary Medical Association. Annual meeting. Hotel Continental, Kansas City, Mo., Feb. 22-23, 1954. Paul L. Spencer, P.O. box 283, Jefferson City, Mo., secretary.

Alabama Veterinary Medical Association. Annual meeting. Admiral Semmes Hotel, Mobile, Ala., April 4-6, 1954. M. K. Heath, Auburn, Ala., secretary.

Texas Conference on Diseases in Nature Trans-

(Continued on p. 30)

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(COMING MEETINGS—*continued from p. 28*)

missible to Man. Annual conference. A. & M. College of Texas, College Station, Texas, April 12-13, 1954. John P. Delaplane, A. & M. College of Texas, College Station, Texas.

American Animal Hospital Association. Annual meeting. Hotel Statler, New York, N. Y., May 5-8, 1954. Wayne H. Riser, 5335 Touhy Ave., Skokie, Ill., secretary.

American Veterinary Medical Association. Annual meeting. The Olympic Hotel, Seattle, Wash., Aug. 23-26, 1954. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

New York State Veterinary Medical Society. Annual meeting. Saranac Inn, Saranac, N. Y., Sept. 15-17, 1954. Joan S. Halat, Utica, N. Y., acting executive secretary.

(*Continued on p. 32*)

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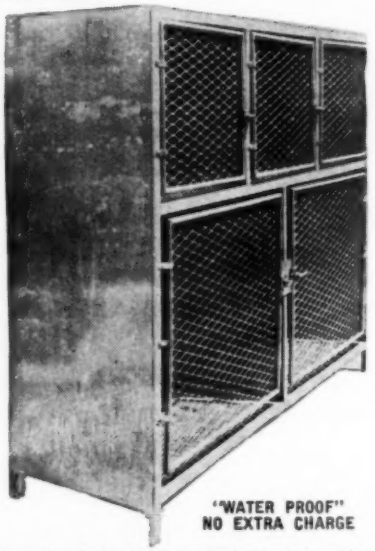

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(COMING MEETINGS—*continued from p. 30*)

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. David E. Madsen, 44 South 4th St., San Jose, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month (except July and August) at Black's Tea Room, Waterloo. F. E. Brutsman, Traer, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. W. E. Smith, 516 Oatman, Sanger, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. Mr. Earl D. Adams, Greensboro, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Coastal Bend Veterinary Association (Texas), the second Wednesday of each month. J. E. Hoban, 4301 S. Port Ave., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. J. R. Rosdail, Pomeroy, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. Robert Clemens, 23352 Orchard, Hayward, Calif., secretary.

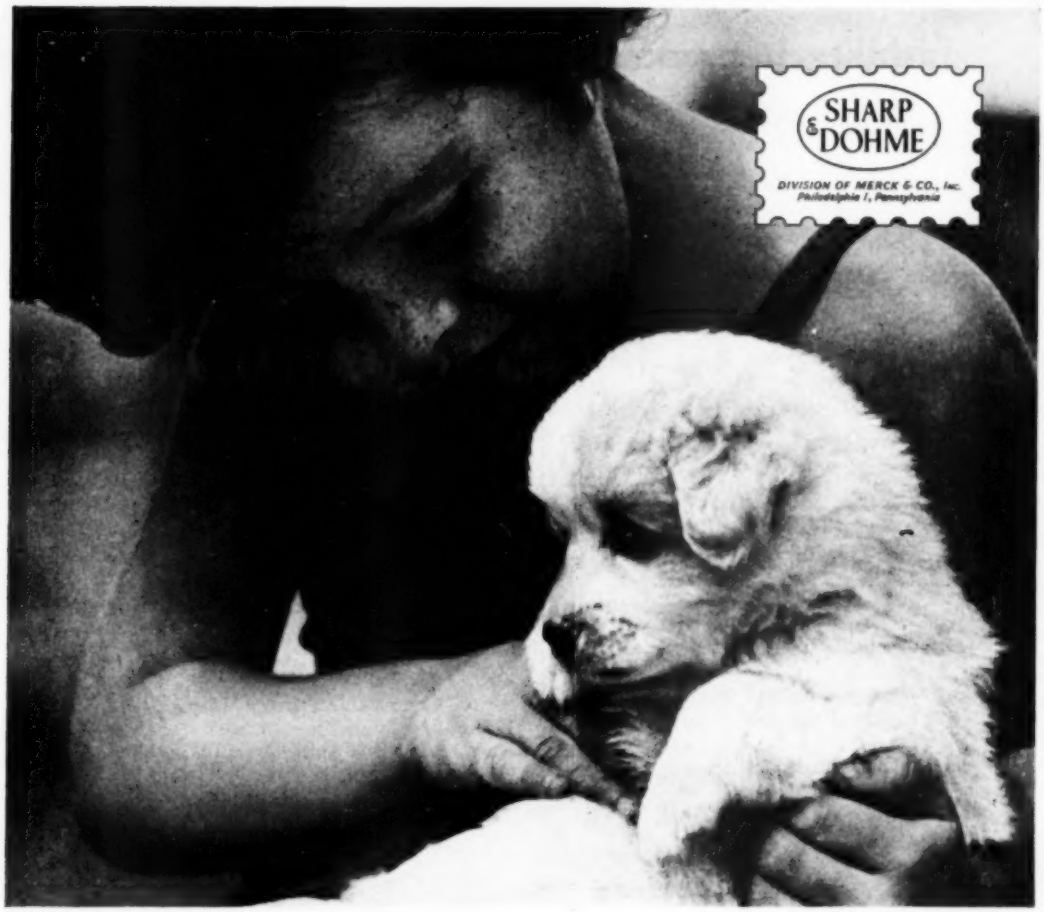
Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. C. B. Randall, Kinston, N. Car., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.

Greater St. Louis Veterinary Medical Association, the first Friday of the month at the York Hotel, Sixth and Market Streets.

(*Continued on p. 34*)



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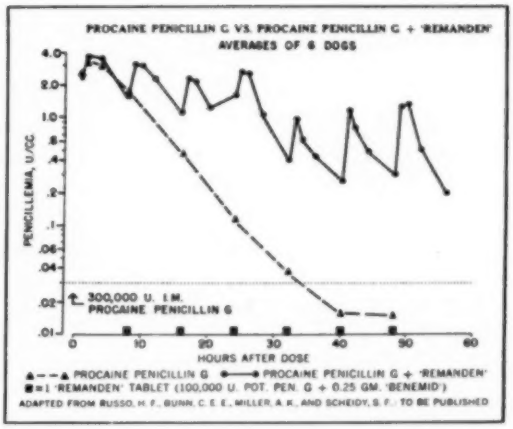

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(COMING MEETINGS—*continued from p. 32*)

Luther E. Fredrickson, Room 11, Municipal Courts Bldg., St. Louis, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. E. M. Lang, 716 E. Broadway, Louisville, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. T. M. Eagle, Parkville, Route 2, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. K. M. Curts, 70 Central Ave., Kansas City 18, Kan., secretary.

Kern County Veterinary Medical Association, the first Thursday of each month. Richard A. Stiern, 17 Niles St., Bakersfield, Calif., secretary.

Keystone Veterinary Medical Association, the Philadelphia County Medical Society Building, 301 S. 21st Street, Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Karl Mayer, 1531 Fourth Ave., Huntington, W. Va., secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from September through May, at the Academy of Medicine of Northern New Jersey, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at Hotel LaSalle, South Bend, Ind. Bruce Hostrawser, 2621 Mishawaka Ave., South Bend, Ind., secretary.

(*Continued on p. 36*)

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(COMING MEETINGS—*continued from p. 34*)

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 66 Marion Ave., Salinas, Calif., secretary.

New Castle County Veterinary Society, the second Wednesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Harold Roberts, Paper Mill Road, Newark R3, Del., secretary.

New York City, Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63 St., New York City. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern Colorado Veterinary Medical Association, the second Monday of each month. William D. Carlson, P.O. Box 478, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday evening from September through June, at the Casa Mana Restaurant, Cedar Lane, Teaneck, N. J. Robert R. Shomer, 1680 Teaneck Road, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Tom Hagan, Gen. Del., Escalon, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. W. C. Schilb, 4312 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 7:00 p.m. in the Antlers Hotel, San Bernardino, Calif. R. E. Hoadley, Coachella, Calif., secretary.

Orange County Veterinary Medical Association, bi-monthly. Donald E. Lind, 2643 N. Main, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the

(*Continued on p. 38*)

Just off the press!

54
fine gift items in '54
More than ever before!
This 1954 Ken-L-Products Premium Catalog is chock full of quality premiums
Read how you can get them FREE of extra cost!
Presented by the makers of Ken-L Biskit, Ken-L Meal, Chappet Horse Meat

FREE

Big new 1954 catalog!

shows valuable premiums offered free to users of dry packed dog food

Send for this new premium catalog today!

See the valuable gifts we offer to users of Ken-L-Biskit and Ken-L-Meal. Gifts like . . . Ekco Five Star Cutlery Set, Oster Electric Clippers, Counselor Bath Scale, Brownie Hawkeye Camera with flash attachment. The catalog is *free*—yours without obligation.

The gifts are free, too—and the catalog tells how easily you can get them.

Our supply of catalogs is limited. So mail in the handy order blank *now*.

Ken-L-Products Division, The Quaker Oats Company
Dept. M, Merchandise Mart Plaza, Chicago 54, Illinois

Please send me—without obligation—your 1954 premium catalog

Name _____

Address _____

City _____ **Zone** _____ **State** _____

To assist us in evaluating the effectiveness of this advertisement, please fill in the following blanks too:

Number of dogs fed _____

Place where fed _____

_____

Brand dry food now used _____

(COMING MEETINGS—*continued from p. 36*)

third Monday of each month. P. H. Hand, Box 1035, Millbrae, Calif., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. G. V. McCranie, Hickory, N. Car., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month, in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Victor T. Oliver, 9705 S.W. Barbur Blvd., Portland 19, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. H. M. Strandberg, 203 D St., Petaluma, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. S. M. Foster, 430 College, Woodland, Calif., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. F. Ferguson, 1702 S. Dort Highway, Flint, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. Warren J. Dedrick, 904 S. Lemon, El Cajon, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, Friday evenings every sixth week. Dee Wodars McDermott, 5879 Hollister, Coleta, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. R. W. Sprowl, 11756 San Vicente Blvd., Los Angeles 49, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. A. Majilton, 1093 N. E. 79th St., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla John Carnes, Muskogee, Okla., secretary.

Foreign Meetings

Second Pan American Congress of Veterinary Medicine. Sao Paulo, Brazil, April 3-10, 1954. Dr. Joao Soares Veiga, chairman; Dr. Virginia Buff D'Apice, secretary general, P.O. Box 7064, Sao Paulo, Brazil.

Just Right!

The Most Complete Service Depot in the Southeast for Serums, Pharmaceuticals, Biologicals, Hog Cholera Vaccines, Laboratory Equipment, Instruments and all the Leading Specialties. . .

Complete Supplies for Graduate Veterinarians

WIRE, CALL OR WRITE YOUR NEXT ORDER TO

ALBANY

For Dependable Service

THE ALBANY SERUM COMPANY

"Complete Veterinary Supplies"

3rd AND FRONT STS. ALBANY, GEORGIA

SCHEMATIC DRAWING OF UDDER OF COW
Alveoli filled with residual milk, leucocytes and bacteria.
Milk duct plugged with debris.

PHYSIOLOGIC APPROACH TO MASTITIS

P.O.P.* purified oxytocic principle

ARMOUR

ADVANTAGES

- **Debridement of "plugged" or "clogged" milk ducts, without pressor effects on blood vessels.**
- **Flushing effect on the entire duct system.**
- **Reduces the dilution of therapeutic agents by eliminating residual milk and exudates.**
- **More efficient penetration of sulfonamides, antibiotics, or other agents to source of infection and throughout the infected quarter.**
- **Early reduction of temperature and edema.**
- **Early return of appetite and normal appearing milk.**
- **Return of normal milk production in 24 hours, in many cases.**
- **Economical.**

*Armour's trade name for veterinary purified oxytocic principle preparation. Double U.S.P. strength.

Sold to Graduate Veterinarians Only

VETERINARY ARMOUR LABORATORIES

A Division of Armour and Company • Kansas City 18, Kansas

CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, $2.50; 8 cents for each additional word. Replies sent in care of the JOURNAL, 25 cents extra.

Remittance must accompany order.

Deadline for want ads 8th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Veterinarian wanted as assistant in small animal practice. License in Virginia required. Salary, plus apartment. Address "Box R 14," c/o JOURNAL of the AVMA.

Veterinarian wanted to assist in mixed practice in Montana. Hospital with complete facilities for small and large animal surgery. Salary commensurate with willingness and ability. Give complete, full particulars when applying. Address "Box S 1," c/o JOURNAL of the AVMA.

Graduate veterinarian wanted for mostly large animal work. Fine location near Chicago; nice clientele. Address "Box S 2," c/o JOURNAL of the AVMA.

Conscientious, small animal man wanted as assistant; Maryland license. Excellent opportunity; write immediately. Address "Box S 3," c/o JOURNAL of the AVMA.

Opportunity for young, unmarried veterinarian to obtain additional experience in small animal hospital operated by charitable organization. Room furnished. Private practice available. Address "Box S 4," c/o JOURNAL of the AVMA.

Veterinarian wanted with or without experience; licensed in Connecticut. Active small animal practice. Excellent opportunity for permanent future. Address "Box S 9," c/o JOURNAL of the AVMA.

Assistant wanted for small animal hospital in rapidly growing suburb, Connecticut license. Compatible arrangement will lead to percentage, partnership, or purchase. Address "Box S 17," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Veterinarian with Missouri license wanted for staff of small animal hospital. Salary and bonus. Give full details, age, marital status, schools attended, et cetera. Address "Box S 23," c/o JOURNAL of the AVMA.

(Continued on p. 42)

Provides an accurate pattern against which to cut with knife or razor blade. Fits firmly, cannot move or slip when clamped into position. Made of non-rusting, light, cast aluminum, highly polished. Lasts a lifetime with minimum care. Simplicity of design and construction reduces possibility of breakage or mechanical failure. Forms immediately available to provide distinctive marking of these breeds:

Boxer — postpaid $15.00
Boston Terrier — postpaid $15.00
Great Dane — postpaid $15.00
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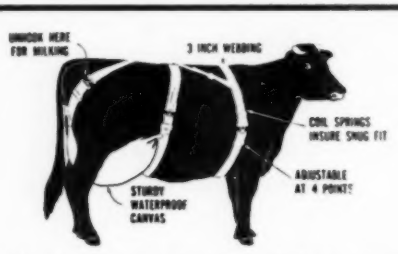
Set of above four — postpaid $50.00

These patented "championship" forms are patterned after markings of winners of top honors in show competition. Forms for other breeds made on special order. Sold to veterinarians only. Send check or money order.

MacALLAN LABORATORIES
Route No. 2, Box 420 Lansing, Michigan



Veterinarians, you can now eliminate congestion or caking, broken down udders, smashed teats, and self-sucking by using

TAMM UDDER SUPPORTS.

The sturdy, waterproof canvas udder cover is ideal for medicated baths or ice packs and will retain body temperature indefinitely. The harness is made of durable 3-in. webbing adjustable at four points and equipped with springs for a snug fit.

Available in four sizes

extra small, heifers, 900 lb. or less; *small,* 900-1,100 lb. cows; *medium,* 1,100-1,600 lb. cows; *large,* cows over 1,600 lb.

Price, $17.50 retail, prepaid.

Special 40% discount for a limited time.

Write for literature and complete information.

FRANKSVILLE SPECIALTY CO.,
Dept. V-12, Franksville, Wis.

Rx. for Drouth-stricken Pasture

Vitamin A DEFICIENCY

This year, more than ever before, good breeding stock, dairy cattle, and feeders will merit careful observation for signs of vitamin and mineral deficiencies compounded by avitaminosis. Pastures have not had the nutrients to give them the proper backlogs they need with which to face the winter. Be safe! Keep RIB-AD No. 2 on hand for quick addition of Vitamins A, D_2, D_3, and Riboflavin sources . . . plus Calcium, Phosphorus, Iodine, and the essential trace minerals — Iron, Manganese, Potassium, Copper, Zinc, and Cobalt.

VpC RIB-AD No. 2 supplies:

Vitamin A—104,320 USP units per pound

Vitamin D_2—68,040 USP units per pound

Vitamin D_3—20,410 AOAC Chic units per pound

Riboflavin—20 milligrams per pound

VITAMIN SOURCES: Irradiated yeast, brewers' dried yeast, vitamin A and D oil, active dry yeast, D-activated animal sterol and wheat germ oil meal.

25 lb. pails
100 lb. drums

VITAMINERAL PRODUCTS COMPANY, Peoria 3, Ill.

SINCE 1915—PIONEER PRODUCERS OF SUPPLEMENT FEEDS FOR VETERINARIANS ONLY

Wanted—Positions

Veterinarian experienced in pharmaceutical and biological manufacture, production research management, seeking genuine opening for permanent employment. Address "Box R 10," c/o JOURNAL of the AVMA.

Experienced Middlewest practitioner desires position in busy large animal practice with possibility of partnership or purchase. Have complete equipment. Married, age 35, reliable, competent. Address "Box S 5," c/o JOURNAL of the AVMA.

Interested in position with small animal practitioner area of Redwood City and Palo Alto, Calif., until get license, then lease or buy. Address Dr. H. Rudman, Miramar Hotel, Santa Barbara, Calif.

WHITE'S ANIMAL CASTRATION

A new textbook for TEACHERS, STUDENTS and PRACTITIONERS.

Price $7.50

For sale by book dealers, also by the Author, George Ransom White, M.D., D.V.M., P. O. Lock Box 901, Nashville, Tennessee.

Relief work—Experienced, graduate veterinarian available for relief work while you are on vacation. Licensed. Address "Box S 10," c/o JOURNAL of the AVMA.

European veterinarian from AVMA-recognized school looks for any kind of employment. Address "Box S 11," c/o JOURNAL of the AVMA.

European veterinarian, recognized school, middle aged, married, no children, looking for permanent employment in a mixed or small animal practice. Address "Box S 13," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Englishman, age 26, graduated B.Sc., M.R.C.V.S., Edinburgh, Scotland, 1948, desires position in large animal practice in Western United States. Experience, 3½ years agricultural practice in England; at present gaining ranching experience in Canada. Address A. Tench, Alexis Creek, B.C.

Knud Moller, veterinarian, Bramminge, Denmark, desires position as an assistant in mixed or large animal practice in the West, California preferred. Graduate of the Royal Veterinary College of Denmark, 1948; 30 years of age, married. Address Alfred Miller, Vermillion, S. Dak.

(*Continued on p. 46*)

NEW IMPROVED RANCH RECORD VETERINARY SYRINGE

The Ranch Syringe was improved lately with a new two piece top cap. The plunger can be removed for sterilization without removing the glass barrel from the metal frame. This improvement makes it easier to sterilize and eliminates breakage. Smooth operation and accurate dosage is assured at all times.

The Ranch Syringe is made with finger bars or three rings.

Inquire at your nearest veterinary dealer or wholesaler about this new improved outstanding product.

Sizes 2cc. to 40cc.

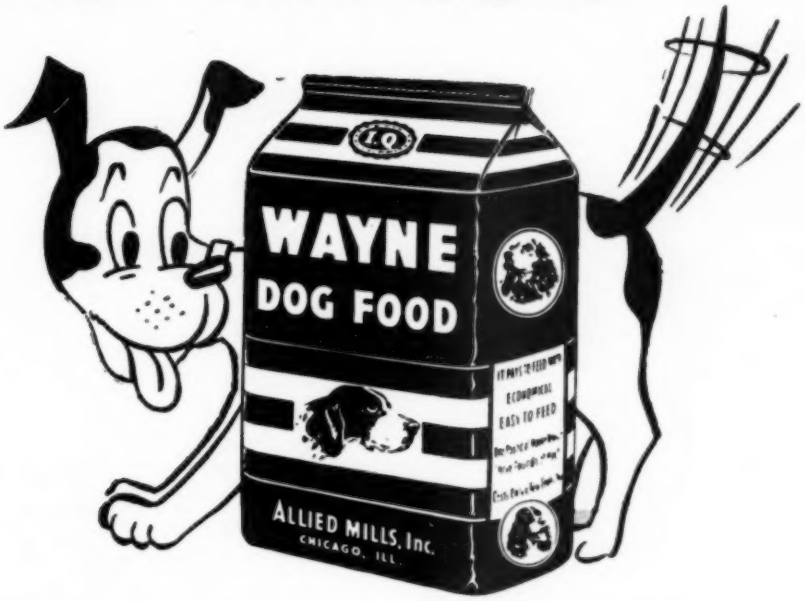
Literature Upon Request

Boston Instrument Mfg. Co. Inc.,

50 Thayer St., Boston 18, Mass.

IT'S A REAL

"TAIL WAGGER"



Here's a quality dog food Veterinarians can feed and recommend with full confidence. It's outstanding because:

- Contains Vitamin B-12 and Antibiotics for Fast Growth and Top Dog Nutrition.
- Dogs Go For Amazing New "Sniff" Factor With Extra Taste and Nose Appeal.
- Contains Extra B-Complex Vitamins For Keen Condition, Better Coats, Brighter Eyes, More Stamina.
- Fat Stepped Up To 7% For More Energy, Higher Palatability, and Feeding Economy.
- Abundantly Supplies Animal Protein through High Levels of Meat and Liver Meal.

FEED IT — THEN RECOMMEND IT!

WAYNE DOG FOOD

Allied Mills, Inc., Kennel Food Division, Fort Wayne 1, Indiana

Correspondence

Life Membership Appreciated

Following notification that they had been elected to Life Membership in the AVMA at the Toronto convention, several of the 51 members who qualified for this distinction, because of at least twenty-five years of continuous good standing and an attained age of not less than 65, have expressed their appreciation in letters to the Associaton. Following are excerpts from these letters.—ED.

• • •

Many thanks for the letter . . . .I miss the many friends who have gone on and not seeing the ones still here. Have passed my eightieth [birthday] but am still a pretty good "quarter horse" even if I can't do the mile . . . .I do some work and have no aches or pains to speak of. So I am very thankful.

s/H. W. Barnard,
Lancaster, Pa.

• • •

Your letter came as a pleasant surprise and I express my deep appreciation. For these many years, I have thoroughly enjoyed the JOURNAL and membership in the Association. They are indispensable in keeping up-to-date on the advancements in our profession.

s/A. L. Blake,
Tucson, Ariz.

Thank you and the other members of the Association. The monthly JOURNAL has always meant a great deal to me and I shall continue to enjoy the fine material it offers.

s/A. H. De Groot,
Dundee, Mich.

• • •

It is difficult for me to express adequately my sincere appreciation of the action by our Association. I had not expected it. So, what more can I say than thanks, and give a pledge of my continued loyalty? Although past the proverbial three score years and ten, I look forward to each issue of the JOURNAL and enjoy it immensely.

s/A. J. DeFossett,
St. Petersburg, Fla.

• • •

Many thanks for your letter. I very much appreciate the action of the Association.

s/C. D. Lowe,
Washington, D. C.

• • •

It is certainly a great honor and I appreciate it very much. I just passed my eighty-third birthday which doesn't mean a thing!

s/H. C. Millar,
Asbury Park, N. J.

(*Continued on p.* 51)

Large Dog Dryer, 5-Cage, 36-Inch Drain Unit, Portable Dryer as seen in our booth at the Southern Veterinary Medical Assn. Convention. We are proud to display Simons' Deluxe Cages and Dryers for the profession to examine and observe the value built into our products before they buy.

"We don't sell all the cages, but we sell the best."

Write for catalog with present price list and for Dryer folder.

BALTIMORE WIRE & IRON WORKS 514 N. Jasper St., Baltimore 1, Md.

NEW

NEW TRAIL-A-VET STOPS THIS!

NEW EFFICIENT METHOD TO "STOP ROUGH HANDLING" OF LIVESTOCK

TRAIL-A-VET means greater safety for both man and animal. A humane method to stop . . . "ROUGH HANDLING" of livestock. A portable operating room on wheels.

NEW in design . . . . . feature after feature . . TRAIL-A-VET provides a new and better way to protect the Veterinarian at work.

EFFICIENT precision sprockets and roller assembly permit 26 adjustments of heavy-duty (parallel) . . . . shock-resistant . . . . spring-loaded, stanchions.

METHOD of controlling fractious animals. Adjustable swinging bar holds animal across rump — controlled by a cable release, operated entirely from the front.

FOR transporting, the safety lock for under-carriage will not permit towing until securely fastened. Trail-A-Vet is equipped with heavy-duty, ball-socket hitch and fastens directly to your automobile for effortless, high-speed towing. Standard equipment includes 640 x 15 rubber tired . . . . automotive, roller-bearing wheels.

HANDLING the animal. Doors open from both sides and in the rear making the animal available from every quarter. Nose and head restriction bars with additional safety features keep animal from slipping and kicking.

LIVESTOCK handling and operating room. Removable instrument and medicine tray. See your local dealer or write direct for literature on TRAIL-A-VET TO .....

the portable

OPERATING ROOM

ON WHEELS

for

VETERINARIANS

MANUFACTURED BY

Carroll IMPLEMENT & MANUFACTURING CORP.

CARROLL, OHIO

Successful mixed animal practitioner, who finds private practice too confining, desires position as field man or like position with drug firm. Single, graduate of approved school. Address "Box S 15," c/o JOURNAL of the AVMA.

Experienced veterinarian, graduate of approved school, desires position in or near large metropolitan area. Salary and percentage or partnership. Best references supplied. Address "Box S 16," c/o JOURNAL of the AVMA.

Graduate of accredited school desires position with small animal practitioner. Excellent background includes five years of small animal experience and experience as corporation veterinarian. Nice appearance; excellent personality. Available immediately; will go anyplace in the United States. Address "Box S 21," c/o JOURNAL of the AVMA.

BROKEN TEETH

—repaired in bottom clipper blades. Top and bottom blades sharpened to match. Save money—Guaranteed.
Prices on Request
HIGHLY SPECIALIZED SHARPENING
Sales—Repairing on Oster and Stewart clippers.
Sharpened Blades Tested on Rabbit Fur
OSTER A-2 $.75 STEWART $1.00
Prompt Service—Est. 17 years
MAIL TO NEWFOUNDLAND 9-3412
CLIPPER SERVICE OAK RIDGE NEW JERSEY

Remittance must accompany advertisement

European veterinarian, three years of experience in small animal practice, desires position as assistant in small animal hospital. Prefer New York City, Chicago, Buffalo, Detroit, or Philadelphia. Can speak English fairly well, but would like to learn more of the language and more of the small animal practice. Licensed and accredited in Ohio and Indiana. Address "Box S 22," c/o JOURNAL of the AVMA.

Wanted—Practices

Would like to purchase a mixed veterinary practice in the Pacific Coast area. A substantial down payment available with all replies given serious consideration. Married, children, and a graduate of an accredited college in 1949. Address "Box R 3," c/o JOURNAL of the AVMA.

Wants to buy small animal hospital in the Denver-Boulder area. Will consider buying into a partnership with right party. Four years' experience. Address "Box S 7," c/o JOURNAL of the AVMA.

Practice wanted in Southwest or Middlewest with capabilities for one or two veterinarians. Prefer small animals; or, at least, 60% small and 40%

(*Continued on p. 48*)

IDEAL for the busy VETERINARIAN...

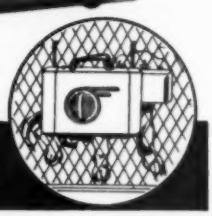
THE NEW EVSCO THREE-HEAT Hair Dryer

LOW PRICED at $26.50

DESIGN FOR DRYING

- **Lightweight—8½ lbs; hangs on any standard dog cage.**
- **Temperature (12" from nozzle) "Lo" heat 103°F. "Hi" heat 134°F.**
- **Low heat, high heat, and cool air flows.**
- **Rubber-cushioned attachments absorb vibrations.**
- **Touch-of-finger operating mechanism.**
- **Beautiful baked enamel finish with chrome trimming.**

110/120 volts.
7 ft. U.L. approved cord.
50/60 cycle AC current only.



HERE IS THE OPPORTUNITY TO OWN MORE THAN ONE DRYER.

ETHICAL VETERINARY SUPPLY CO.
34-28 31st STREET, LONG ISLAND CITY 6, N. Y.

the FACTS about DYNAMIC PHOSPHORUS

This New Hampshire male is from an experimental lot of birds that averaged 3.10 lbs. at 8 weeks. Such growth is possible only with an optimum phosphorus level.

● The *effectiveness* of the phosphorus used in poultry and livestock rations helps determine how well other ingredients are utilized. Feed phosphorus must be "dynamic" — readily assimilable by the animal for optimum contribution to production, health and livestock profits.

Yet, this often is overlooked by the farmer. Production slowdowns and breeding failures related to phosphorus-deficient rations are frequently attributed to other causes — unless pointed out by the veterinarian and verified by blood serum tests.

Today, leading feed manufacturers recognize the important role of phosphorus. They know that natural grains and forages fail to provide enough phosphorus for the high production required of farm animals. As a result, many are now using International's new 20/FOS as the phosphatic ingredient in their formula feeds and minerals.

20/FOS phosphate is ideal for this purpose. It supplies "dynamic" phosphorus, with a biological availability of 100 . . . equal to pure *beta* tricalcium phosphate. 20/FOS is unusually high in phosphorus (20%), unusually low in fluorine (160:1 P-F ratio). It is safe for all feeds; promotes more efficient digestion and assimilation; helps farm animals grow faster, stay healthier.

MINERALS International CHEMICALS

20/FOS® Phosphate

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

the Nation's Largest Producer of Phosphates • General Offices: 20 North Wacker Drive, Chicago 6

Sold only to Graduate Veterinarians

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for the effective treatment of skin conditions

Destroys fungi; sarcoptes scabei canis; demodex canis; mites; fleas; lice. Repels ticks. Non Staining; not greasy; has no objectionable odor, destroys odors of external origin. Non Toxic; may be used daily in recommended dilution. Concentrated; one gallon makes four.

Gallon	Quart
$13.95	$4.00
Makes 4 gallons	Makes a gallon

Available nationally through well known Distributors

Osco Chemical Company, Inc.

P.O. Box 2157, Atlanta 1, Georgia

CATS and kittens
Train themselves naturally
with KITTY LITTER

— a specially processed material which takes the place of messy sand and requires less frequent replacement.

ABSORBS
DEODORIZES

It is clean, sanitary, disposable . . . easy to use, economical . . . harmless to pets. A 5-lb. package lasts several weeks. Sold and used by leading veterinarians and cat owners everywhere.

ASK FOR NAME OF NEAREST JOBBER.

Free Literature on Request

LOWE & LOWE COMPANY

Dept. 110 **Cassopolis, Mich.**

(CLASSIFIED ADS—*continued from p. 46*)

large. Would consider partnership. Experienced. Have B.S., D.V.M., M.S. degrees. Address "Box S 19," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Large animal practice for sale in fertile valley in Wyoming. Practice is 90% dairy. Drugs and equipment included. No competition. Price $5,000 with $2,500 down. Address "Box S 12," c/o JOURNAL of the AVMA.

Modern tile and glass small animal hospital and 2-bedroom home on 4 acres, for sale or lease with option to buy. City of 50,000 population in East Texas. Hospital completely equipped, including x-ray, tile cages, and concrete runs. Purchase of drug inventory optional. Address "Box S 6," c/o JOURNAL of the AVMA.

Modern hospital for sale in suburb of Detroit servicing population of 300,000. Excellent central location on key thoroughfare. Practice established eleven years, operated by appointment only. Real estate alone worth $22,500; total price, including practice, drugs, equipment, $30,000, $10,000 down. Would consider lease to right practitioner. Seven-room house available, adjacent to hospital. Dr. Wm. A. Houghten, 1513 S. Main St., Royal Oak, Mich.

Veterinary drugs and instruments for sale, $1,500; included desirable northern Iowa location. Address "Box S 8," c/o JOURNAL of the AVMA.

(*Continued on p. 50*)

Kennel Cage Units

of Wire Mesh and Metal

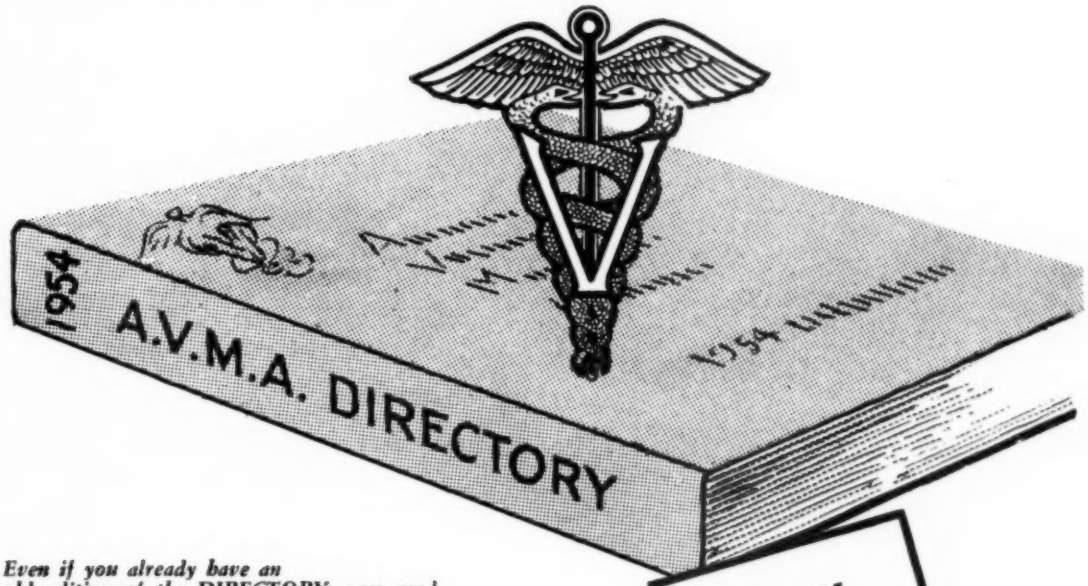
IN TWO TIERS: 4, 6, and 8 cage units
IN THREE TIERS: 6, 9, and 12 cage units
Sanitary, durable, and easily maintained; galvanized materials; removable pans; hand woven wire mesh doors, maximum light and ventilation; sized for dogs and cats; removable partitions; shipped crated; easily assembled.

THE EIGHT CAGE UNIT
manufacturers

EAST RIVER WIRE WORKS
39-40 Twenty-first St., Long Is. City 1, N.Y.

NOW AVAILABLE...

1954
AVMA DIRECTORY



NEW ADDITION

Even if you already have an old edition of the DIRECTORY, you need this brand-new revised and enlarged edition to give you up-to-date information about your profession.

Provides fingertip information on many phases of the profession besides listing more than 17,000 names and addresses of veterinarians.

Price: $2.50 to AVMA members, $15.00 to non-members. (Limited quantity also available in casebound hardcovers; $3.50 to AVMA members; $16.00 to non-members.)

ORDER YOUR COPY NOW—PAY LATER

American Veterinary Medical Ass'n.
600 So. Michigan · Chicago 5, Ill.

Please send me a copy of the new 1954 AVMA DIRECTORY: ☐ Payment enclosed ☐ Bill me
(Check type of cover desired: ☐ Standard ☐ Casebound)

Print Name .....

Print Address .....

City & State .....

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(*Continued on p. 54*)

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and the

American Journal of Veterinary Research

Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals.

Manuscripts.—Manuscripts must be typewritten, double-spaced, on 8½ by 11 in. bond paper, and the original, not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones. Footnotes and bibliographies also should be typed double space and should be prepared in the following style: name of author, title of article, name of periodical with volume, month (day of month, if weekly), and year.

Illustrations.—Photographs should be furnished in glossy prints, and of a size that will fit into the Journals with a minimum of reduction. Photomicrographs which cannot be reduced should be marked for cropping to 1-column or 2-column width. Drawings should be made clearly and accurately in India ink on white paper. Figures appearing on graphs or charts should be large enough to allow for reduction necessary for the chart or graph to fit on Journal pages. All illustrations should bear the name of the author on the back.

Tables.—Tables should be simple and typed double-space. Complex tables are not conducive to perusal. It is wiser to summarize complex material rather than to attempt to tabulate it.

News.—Secretaries of associations and readers are requested to send us announcements of meetings and news items.

Anonymous Letters.—Anonymous communications, of whatever nature or purpose, to the JOURNAL or to the Association will not be published or referred for consideration to any Association official or committee.

AMERICAN VETERINARY MEDICAL ASSOCIATION

600 So. Michigan Avenue

Chicago 5, Illinois

(CORRESPONDENCE—*continued from p. 44*)

Life Membership Appreciated—continued

I appreciate greatly the honor. I have missed four AVMA meetings in the past thirty years and have seen great progress in the profession's standing, much of it due to the good work of the Association which I know will continue.

s/W. T. Spencer,
Lincoln, Neb.

• • •

My thanks and appreciation for the life membership and continued receipt of the JOURNAL. Not being able to attend meetings, this keeps me up-to-date on veterinary matters.

s/Henry E. Torgerson,
Mountain View, Calif.

• • •

I am greatly honored and pleased and express my appreciation for the privilege of life membership, especially the grand monthly review [the JOURNAL].

s/J. L. Tredeau,
St. Boniface, Man., Canada.

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Dr. J. D. Ray

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(CLASSIFIED ADS—*continued from p. 50*)

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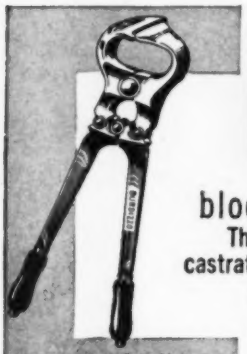

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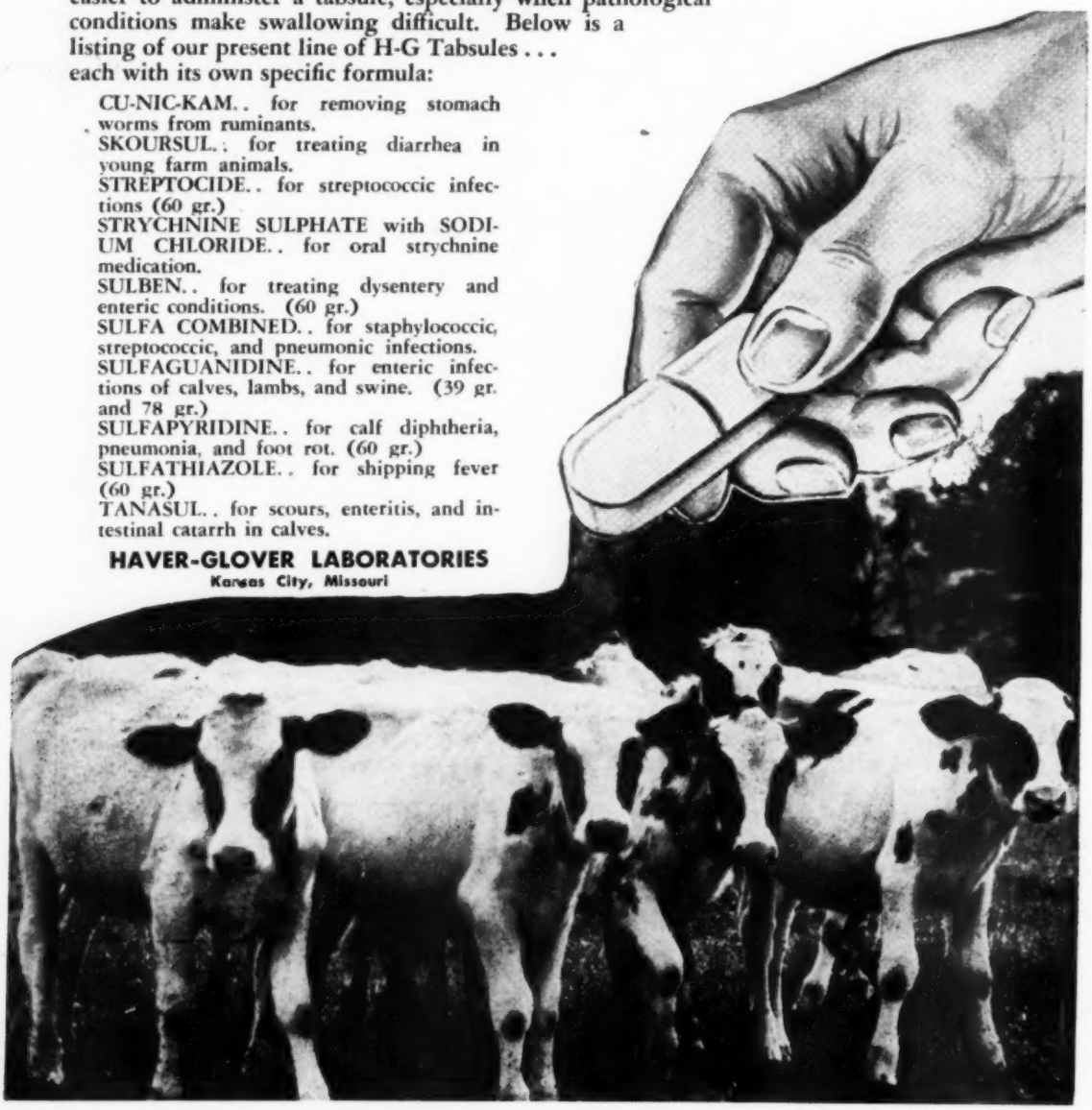

RABIES VACCINE

(Lockhart)

PHENOLIZED RABIES VACCINE CONTROLS OUTBREAK

According to Frederickson *et al.*,[1] the 1950 to 1951 rabies epizootic in St. Louis was controlled quickly, by mass vaccination of the dog population, after quarantine measures alone had failed. Neighboring communities continued to have a high incidence of rabies. Although only about 0.5 percent of the 38,006 dogs vaccinated in the clinics received modified live virus vaccine, and the overwhelming majority received the usual 20 percent phenolized vaccine of caprine and ovine origin, not a single case of postvaccinal paralysis was reported to the Health Division. These figures would indicate that the danger of postvaccinal paralysis in dogs, following administration of phenolized rabies vaccine, may have been greatly exaggerated recently.

1. Frederickson, L. E.; Willett, J. C.; Smith, J. E., and Price, E. R.: Metropolitan rabies epizootic controlled by vaccination. Vet. Med. **48** (1953) 276-279, 288.

(From The North American Veterinarian, Nov. 1953)

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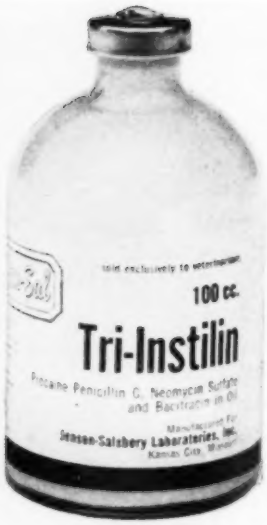

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